DOCUMENT RESUME

ED 247 815 HE 017 462

TITLE	Summaries of Reports to the Panel by U.S. and Canadian Medical Schools, Undergraduate Colleges and Universities, and Academic Societies. AAMC Project on the General Professional Education of the Physician and College Preparation for Medicine.
INSTITUTION	Association of American Medical Colleges, Washington, D. C.
SPONS AGENCY	Kaiser Foundation, Oakland, Calif.
PUB DATE	Oct 83
NOTE	281p.; For related document, see HE 017 461.
AVAILABLE FROM	Association of American Medical Colleges, One Dupont Circle, N.W., Room 200, Washington, DC 20036 ($5.00, book rate; quantity discounts).
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC12 Plus Postage.
DESCRIPTORS	*College Preparation; College Programs; Competence; Educational Improvement; Educational Needs; Higher Education; *Institutional Characteristics; Knowledge Level; *Medical Education; *Medical Schools; *Program Evaluation; Skill Development; Student Attitudes; *Teacher Associations; Values
IDENTIFIERS	*Association of American Medical Colleges

ABSTRACT

Reports from the American Association of Medical Colleges' Project on the General Professional Education of Physicians and College Preparation for Medicine are presented. The 3-year project assessed the present educational approaches and developed recommendations to improve instructional programs and learning. Broad discussions about medical and college education were also stimulated among the medical school and college faculties and their disciplinary societies. One- to two-page summaries of written reports from 77 U.S. and Canadian medical schools, 22 undergraduate institutions, 21 disciplinary/professorial organizations, and 9 other groups are provided. The summaries describe: major institutional or organizational concerns about medical and college preparation work; modifications of educational strategies currently under consideration; the likelihood of implementation of these modifications; and any impediments to change. The project involved three working groups that considered essential knowledge, fundamental skills, and personal qualities, values, and attitudes. Appended are a roster of the AAMC project members, a roster of institutional participants, and programs of four regional meetings. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED247815

AAMC Project on
the General Professional Education of the Physician
and College Preparation for Medicine

Summaries of Reports to the Panel by U. S. and Canadian Medical Schools, Undergraduate Colleges and Universities, and Academic Societies

October 1983

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

AAMC

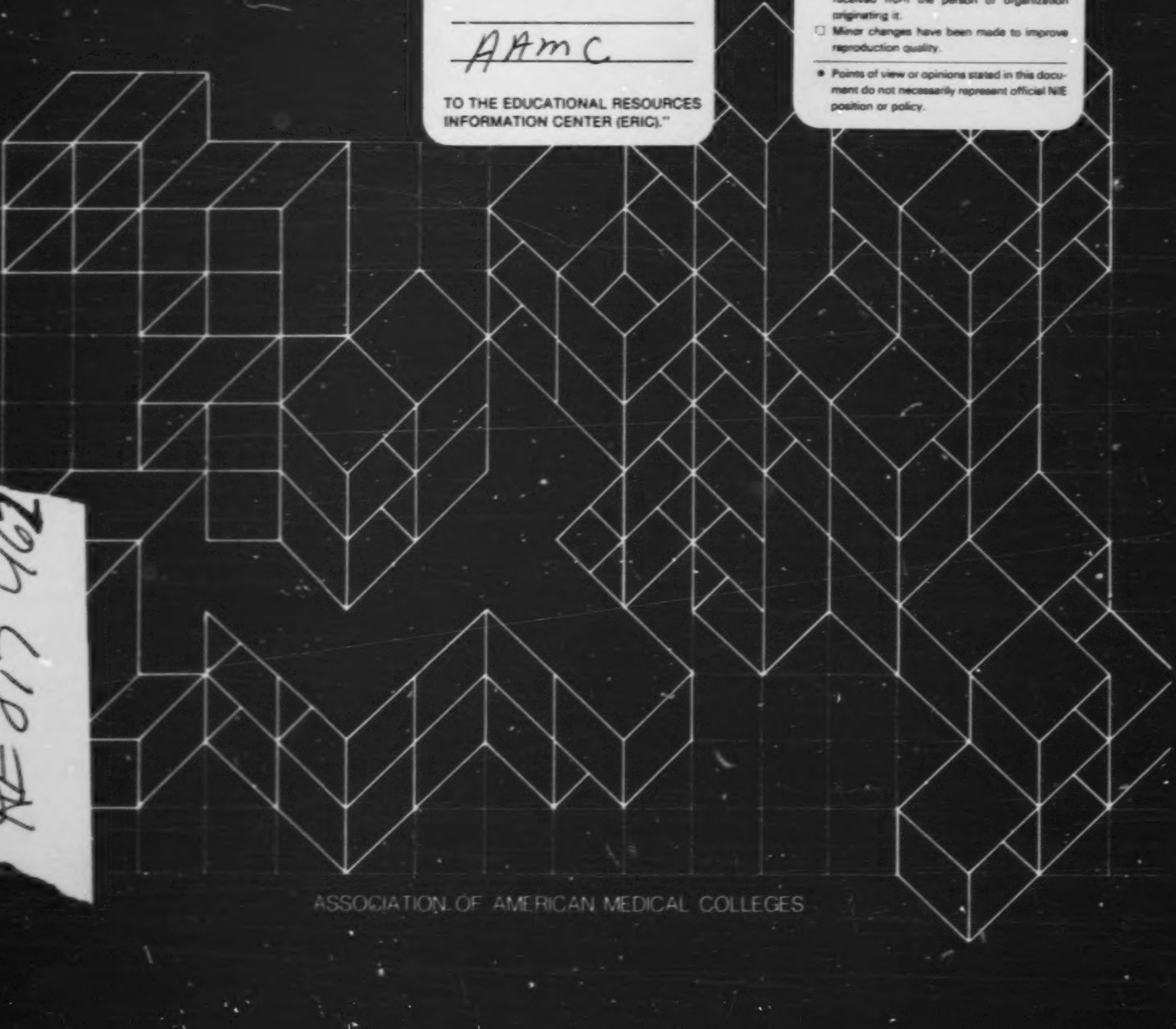
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.



HE 017 462

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES
expresses grateful appreciation to
THE HENRY J. KAISER FAMILY FOUNDATION
for their generous support
of the
PROJECT ON THE GENERAL PROFESSIONAL EDUCATION OF THE
PHYSICIAN AND COLLEGE PREPARATION FOR MEDICINE

ORDERS

Address orders for this book to:

Association of American Medical Colleges
Attn. Membership and Publication Orders
One Dupont Circle, N.W., Suite 200
Washington, D.C. 20036

Single copies are $5.00 (shipped book rate) and $8.50 (shipped priority mail). Discounts on orders for multiple copies are available as follows: six-25 copies less 20%; 26-50 copies less 30%; and over 51 copies less 40%. Orders of $25.00 or less must be paid in advance. Orders above $25.00, if not prepaid, must be accompanied by an institutional purchase order.

Copyright 1983 by the Association of American Medical Colleges. All material subject to this copyright may be photocopied for the noncommercial purpose of scientific or educational advancement. Printed in U.S.A.

CONTENTS

See Page

FOREWORD . . . vii

SUMMARIES OF REPORTS FROM U.S. AND CANADIAN MEDICAL SCHOOLS . . . 1

Albany Medical College . . . 3
University of Arizona College of Medicine . . . 4
University of Arkansas College of Medicine . . . 5
Baylor College of Medicine . . . 7
Boston University School of Medicine . . . 8
Bowman Gray School of Medicine . . . 10
Brown University Program in Medicine . . . 12
University of Calgary Faculty of Medicine . . . 14
University of California, Los Angeles, School of Medicine . . . 17
University of California, San Diego, School of Medicine . . . 19
University of California, San Francisco, School of Medicine . . . 21
Case Western Reserve University School of Medicine . . . 23
University of Chicago Pritzker School of Medicine . . . 25
University of Colorado School of Medicine . . . 27
University of Connecticut School of Medicine . . . 29
Creighton University School of Medicine . . . 30
Dartmouth Medical School . . . 32
East Carolina University School of Medicine . . . 34
Albert Einstein College of Medicine . . . 36
George Washington University School of Medicine . . . 38
Medical College of Georgia . . . 40
University of Hawaii School of Medicine . . . 43
Howard University College of Medicine . . . 44
Indiana University School of Medicine . . . 46
University of Iowa College of Medicine . . . 47
Jefferson Medical College . . . 49
Johns Hopkins University School of Medicine and School of Arts and Sciences . . . 51
University of Kansas School of Medicine . . . 53
University of Kentucky College of Medicine . . . 55
Louisiana State University, New Orleans, School of Medicine . . . 57
Louisiana State University, Shreveport, School of Medicine . . . 59
University of Maryland School of Medicine . . . 60
University of Massachusetts Medical School . . . 62
McMaster University Faculty of Medicine . . . 64
Mercer University School of Medicine . . . 67
University of Miami School of Medicine . . . 69
Michigan State University College of Human Medicine . . . 71
University of Minnesota, Duluth, School of Medicine . . . 72
University of Minnesota, Minneapolis, Medical School . . . 73
University of Missouri, Columbia, School of Medicine . . . 75
University of Missouri, Kansas City, School of Medicine . . . 76

CONTENTS
(Continued)

See Page

Mount Sinai School of Medicine 77
University of Nebraska College of Medicine 80
University of Nevada School of Medicine 82
University of Medicine and Dentistry of New Jersey-New Jersey Medical School 84
New York Medical College 85
New York University School of Medicine 87
State University of New York, Buffalo, School of Medicine 89
State University of New York, Upstate, College of Medicine 91
University of North Carolina School of Medicine 93
University of North Dakota School of Medicine 95
Northwestern University Medical School 97
Medical College of Ohio 99
Ohio State University College of Medicine 101
University of Ottawa School of Medicine 103
Medical College of Pennsylvania 105
Pennsylvania State University College of Medicine 107
University of Pennsylvania School of Medicine 109
University of Pittsburgh School of Medicine 111
University of Rochester School of Medicine 113
Rush Medical College 114
Saint Louis University School of Medicine 115
Southern Illinois University School of Medicine 117
Stanford University School of Medicine 119
Stritch School of Medicine 121
Texas Tech University School of Medicine 122
University of Texas, Galveston, Medical School 124
University of Texas, Houston, Medical School 126
Tufts University School of Medicine 128
Tulane University School of Medicine 129
University of Utah School of Medicine 131
University of Virginia School of Medicine and College of Arts and Sciences 133
University of Washington School of Medicine 134
Medical College of Wisconsin 136
University of Wisconsin Medical School 137
Wright State University School of Medicine 139
Yale University School of Medicine 140

SUMMARIES OF REPORTS FROM UNDERGRADUATE COLLEGES AND UNIVERSITIES 143

Brandeis University 145
Brigham Young University 147
University of California, Santa Cruz 150
Carleton College 152
Clemson University 154
University of Connecticut 156

CONTENTS
(Continued)

See Page

Davidson College 158
Fordham College 160
Hamilton College 162
Haverford College 165
Hunter College 167
Iowa State University 169
University of Kansas 171
University of Michigan 173
Montana State University 176
Pomona College 179
Simon Fraser University 181
Smith College 182
University of Texas, Austin 184
Wabash College 186
University of Washington 188
Xavier University 190

SUMMARIES OF REPORTS FROM COUNCIL OF ACADEMIC SOCIETIES PROFESSORIAL ORGANIZATIONS 193

Association of Anatomy Chairmen 195
Association for the Behavioral Sciences and Medical Education 197
Association of Medical School Departments of Biochemistry 199
Association of Professors of Dermatology 201
Association of Departments of Family Medicine 202
Association of Professors of Gynecology and Obstetrics 204
Association of Professors of Medicine 206
Association of Medical School Microbiology Chairmen 209
American Association of Neurological Surgeons 211
Society for Neuroscience 213
Association of University Professors of Ophthalmology 215
Association of Pathology Chairmen 217
Association of Medical School Pediatric Department Chairmen 219
Association for Medical School Pharmacology 221
Association of Academic Physiatrists 223
Association of Chairmen of Departments of Physiology 225
Plastic Surgery Educational Foundation 227
Association of Teachers of Preventive Medicine 228
American Association of Chairmen of Departments of Psychiatry 230
Society of Chairmen of Academic Radiology Departments and Association of University Radiologists . 232
Thoracic Surgery Directors Association 234

CONTENTS
(Continued)

See Page

SUMMARIES OF REPORTS FROM OTHER GROUPS 237

- American Medical Students Association 239
- Association of Academic Health Sciences Library Directors 241
- Chicago Medical Society Student Branch 243
- Illinois State Medical Society 246
- Minority Affairs Section of the Group on Student Affairs 248
- Proposal for a Program in Human Health and Global Security 250
- Rural Practice Network 252
- San Francisco Medical Society 255
- Society for Health and Human Values 257

APPENDIX
(Page 259)

See Page

ROSTERS OF PROJECT MEMBERS 261

- Panel 261
- Working Group on Essential Knowledge 263
- Working Group on Fundamental Skills 264
- Working Group on Personal Qualities, Values, and Attitudes 265
- AAMC Staff 267

ROSTERS OF PROJECT PARTICIPANTS 269

- U.S. and Canadian Medical Schools 269
- Undergraduate Colleges and Universities 270
- Council of Academic Societies Professorial Organizations 270

PROGRAMS OF REGIONAL HEARINGS 271

- Western Regional Hearings: University of California, San Francisco, School of Medicine, January 27-28, 1983 271
- Southern Regional Hearings: University of Texas, Houston, Medical School, February 24-25, 1983 273
- Midwestern Regional Hearings: Northwestern University Medical School (Chicago), March 24-25, 1983 275
- Northeastern Regional Hearings: New York Academy of Medicine (New York City), May 5-6, 1983 277

FOREWORD

The year 1983 was one of fact-finding for the AAMC Project Panel on the General Professional Education of the Physician and College Preparation for Medicine. In order to gain a broad, yet detailed view of the issues identified in the project, the panel established two avenues of communication--testimony at regional hearings and written submissions--through which project participants were invited to describe:

- Major institutional or organizational concerns about the general professional education of the physician and college preparation for medicine
- Modifications of educational strategies currently under consideration
- Likelihood of implementation of these modifications
- Any impediments to change

The four regional hearings held between January and May provided the panel with over 30 hours of testimony and discussion by representatives from 51 U.S. and Canadian medical schools, nine undergraduate colleges and universities, 17 disciplinary, professorial organizations, and 12 other groups. Added to this data base were almost 900 pages of written reports from 58 U.S. and Canadian medical schools, 21 undergraduate colleges and universities, 17 disciplinary, professorial organizations, and six other groups.

So impressed were the project panel members with this wealth of information generated by the project participants, that they felt it important that the ideas be widely disseminated among the project participants and others. The decision was made to prepare one- or two-page summaries of the written reports, and to ask the contributors if they would be willing to have them published as written; or, if they preferred, revised as they would direct--from a few changes to extensive revisions. They were also given the option of declining to have us publish a summary of their reports. None did this.

Next, it seemed appropriate that the presentations of project participants who appeared before the panel in one of the four regional hearings, but who had sent AAMC no written report, also be included with the written summaries. Of the four hearings, two were tape recorded and two were recorded by stenotypists. Distillates of these records were prepared, but the press of the publication schedule was such that presenters had no opportunity to review the summaries. Transcripts being what they are, we apologize for whatever inaccuracies appear in these offerings. Our hope is that the summaries are better included than excluded due to this inevitable technical problem.

Finally, we felt that we would like also to include in this volume the other presentations made at the hearings: these vary widely and without their inclusion readers would be denied learning of the insights afforded the panel from a wide spectrum of diverse viewpoints, such as the San Francisco Medical Society, who were specially invited guests to the Western Regional Hearings.

We hope that this volume will be a useful reference not only to project participants, but also to students, faculty, and key decision-makers concerned about the issues of the general professional education of the physician and college preparation for medicine. I will welcome any general comments about this volume or about the project in general. Specific comments about individual programs should be directed to the person whose name, address, and phone number head each summary.

ACKNOWLEDGMENTS

The enthusiastic cooperation of the project participants in responding to the project panel's call for information and their subsequent willingness to consent to the publication of these summaries are gratefully acknowledged. The volume was compiled by Mary H. Littlemeyer, Project Editor and Coordinator, and her staff: F. Daniel Davis, Assistant Editor, and Barbara D. Roos, Assistant Project Coordinator. They were responsible for the planning, production, and preparation of the summaries from the written reports and from the transcripts of the four regional hearings. This project is made possible by a generous grant from The Henry J. Kaiser Family Foundation.

August G. Swanson, M.D., Director
Department of Academic Affairs
Project Director, General Professional
Education of the Physician and College
Preparation for Medicine

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Suite 200/One Dupont Circle, N.W./Washington, D.C. 20036/(202) 828-0400

SUMMARIES OF REPORTS FROM U.S. AND CANADIAN MEDICAL SCHOOLS

ALBANY MEDICAL COLLEGE

For Additional
Information, Contact: Richard H. Edmonds, Ph.D.
Associate Dean for Administrative and Academic Affairs
47 New Scotland Avenue, Room MS-103
Albany, NY 12208
(518) 445-5548

In approaching the study of the Albany Medical College environment, including the GPEP Study, Albany began with certain basic assumptions:

1. That medical education is a continuum of which premed and undergraduate medical education represents the first phase--residency training, postdoctoral training, and continuing education activities would be considered only in so far as these post-M.D. activities are affected by the undergraduate medical curriculum.

2. The goals and objectives of the review of the undergraduate medical education curriculum at the Albany Medical College must address the processes necessary to achieve the stated goals and objectives.

3. The department chairmen or program directors will continue to assume primary responsibility for seeing that the content of their areas is well defined by the faculty for the students.

4. They would propose a series of goals and objectives to serve as a frame of reference for the ongoing review and possible modification of the curriculum.

5. Students would be selected so that each class includes individuals with interest in research and/or academic and/or health administration careers as well as those who wish to enter clinical practice.

Given these basic assumptions, five general goals for the curriculum were developed:

1. Define clearly and evaluate all aspects of the curriculum, including courses, clerkships, and electives.

2. Provide all students with experiences that stimulate the development of analytical thinking and problem-solving approaches.

3. Provide improved integration of curriculum content within and between basic science courses and clinical clerkships for both students and faculty.

4. Provide students with better support for making career decisions including selection of clinical rotations, schedules, and residency training programs.

5. Ensure that the instructional resources of the institutions are effectively and efficiently utilized.

Having elaborated these goals, there were some 15 objectives and action steps that were proposed to implement these goals.

UNIVERSITY OF ARIZONA COLLEGE OF MEDICINE

For Additional
Information, Contact: Marilyn Heins, M.D.
Vice Dean
Academic Affairs Office Room 2208
Tucson, AZ 85724
(602) 626-7163

Following are some of the ideas that emerged in discussions of the "Charges" booklet at Arizona:

1. Integration of basic sciences with the clinical sciences needs in-depth study and address. Additionally, the impact of work and environment upon the patient should be included throughout the curriculum. The importance of social problems should receive attention, but should not supersede attention to pathophysiology and science.

2. Emphasis on seminar, conference, computer-assisted education, role modeling in the clinical arena, and less emphasis on lectures should be considered.

3. Student counselling should be readily available and the faculty should be sensitive to personal problems and stresses of the students.

4. Greater emphasis on ambulatory settings for clinical education is necessary.

5. Students should understand statistics and statistical methods in order to better appreciate the medical literature.

6. The areas of philosophy of science, moral reasoning, medical ethics, human communication, business management, and English composition receive insufficient emphasis in medical school.

7. Assessment of the student's achievement of essential knowledge is accomplished only partially by the National Board Examination.

8. Most faculty stressed the need for entering students to have skills in reading, reasoning, ethics, and the humanities.

9. The MCAT provides a good general indication of general student abilities that is generally correlated with general student achievement. The Admissions Committee feels that the MCAT scores should never be the sole indicator for deciding whether to accept an applicant.

UNIVERSITY OF ARKANSAS COLLEGE OF MEDICINE

For Additional
Information, Contact: Ture W. Schoultz, Ph.D.
Associate Dean for Student Affairs
4301 West Markham
Little Rock, AR 72205
(501) 661-5348

The University of Arkansas College of Medicine concentrated its analysis of and solutions to problems in medical education on the first two years of medical school. They cite the following problems with this phase of the undergraduate medical curriculum:

1. Students learn too much detail and too few concepts.
2. Too many students fail to initiate and continue self-study habits.
3. There is too little time for the study of new topics.
4. There is not enough flexibility for students to do research or to repeat a course if failed.
5. Student/faculty relationships all too frequently are characterized by discord.

The following factors are thought to contribute to these problems:

1. The explosion of scientific information;
2. Large classes of students (136) and limited numbers of laboratories and small group conferences, both of which inhibit faculty and students from getting to know one another;
3. The periodic diversion of faculty interest and time from teaching to research and clinical service;
4. Overemphasis upon successful completion of the National Boards (subject exams) and the orientation of the students toward that one, narrow goal;
5. Frequent examinations focused on the recall of "facts" and the failure to teach and evaluate the student's understanding of concepts and principles; and
6. The ethos of self-interest and competition that is prone to emerge from medical school experience from the admissions process to the assignment of residencies.

Having identified the problems and their contributory factors, the University of Arkansas College of Medicine concluded that they had to define the goals of the first two years of medical school:

1. Students need to understand the terminology and be knowledgeable of basic concepts in the biomedical sciences that relate to human medicine.

2. Students need to understand the process of problem identification, data collection, hypothesis formulation, and the application of deductive reasoning in problem solving.

3. Students need to recognize that current scientific information should be the basis of medical practice and therefore to understand the following: (a) what the sources of current information are; (b) how to use the sources; (c) how to evaluate the data received; and (d) need for biomedical research.

4. Students need to accept responsibility for a lifetime of self-learning with the required allocation of time and energy to pursue this endeavor.

5. Students need to have a strong understanding of human behavior and have a sense of responsibility and compassion toward patients and family.

6. Students need to develop the ability to communicate clearly in written and oral form.

In addition to a general proposal that education and teaching be reemphasized as a major mission of the medical school, the University of Arkansas College of Medicine presented the following specific proposals for dealing with the problems identified in the first two years of undergraduate medical education:

1. Limit didactic instruction (i.e., lectures) to 15 hours per week in all courses;

2. Present 50 percent of the material in small group discussions, laboratories, or self-study units;

3. Make 50 percent of the material available in the form of self-study by 1986 so that students have the option of taking part of a course as independent study;

4. Do not count "pop" or weekly quizzes as part of the course grade;

5. Limit the number of examinations to three plus the final in lecture courses and to two plus the final in laboratory courses.

6. Lengthen the sophomore year from 27 weeks to 32 weeks without increasing the number of contact hours in any course.

BAYLOR COLLEGE OF MEDICINE

For Additional
Information, Contact: Temple W. Williams, M.D.
Professor of Medicine/Infectious Diseases
6565 Fannin MS-910
Houston, TX 77030
(713) 790-2507

Selected faculty responses were provided by Baylor to illustrate their primary concerns with essential knowledge:

1. Both quantity and characteristics of essential knowledge to be retained by students may drastically decrease if it is assumed that all physicians will have ready access to computer-based systems that will synthesize answers. The question remains as to the total knowledge the physician will need to accept a computer-based diagnosis.

2. If a broader baccalaureate education is thought to be beneficial in acquiring students with more favorable qualities, then changing admissions policies to require broader scope of courses is needed; however, it is not clear that simply a broader baccalaureate education per se will foster the student qualities sought.

3. Methods used to establish criteria for the necessary knowledge of biomedical sciences usually are established by individual instructors. The criteria perhaps only fortuitously represent knowledge necessary for the general professional education of a physician. This situation could be remedied by development of conferences between basic scientists and clinicians. In these conferences, criteria could be discussed then established. Clinicians should be divided into two groups, one representing academicians and the other practicing physicians.

4. Basic and clinical science could be taught simultaneously. In such an approach, students might better appreciate the importance of basic science information to clinical practice.

5. In general, core lecture series developed by faculty of clinical departments do not distinguish between the knowledge essential for all physicians and the knowledge their graduates should have to be prepared for specialized education.

6. The ideal mechanism for deciding which clinical knowledge is essential for all physicians is probably best done by continuing review of the medical school curriculum. In individual departments, review of core lecture series and review of grades by all students on standardized national tests, such as the National Boards, could certainly clarify whether the proper material is being taught.

7. It would appear that the clinical rotations in medicine, surgery, pediatrics, and obstetrics and gynecology would cover most of the clinical problems that a physician can expect to see during his career.

BOSTON UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Arthur J. Culbert, Ph.D.
Assistant Dean
80 East Concord Street
Boston, MA 02118
(617) 247-6744

Boston University reported on the effect of its participation in the Modular Medical Integrated Curriculum (MMEDIC) Program on the general professional education of the physician and college preparation for medicine, focusing on the educational sequence that includes the last two years of undergraduate school and the first two years of medical school. Structural components of the program that provide the essential body of scientific knowledge and fundamental skills, and reinforce the development of those personal qualities, values, and attitudes necessary for the humanistic side of medical practice, were delineated.

The purpose of the MMEDIC Program has been to better integrate the premedical and preclinical educational pathways for students. Each year since 1977, 15 qualified students at Boston University have been accepted into the MMEDIC Program at the completion of their sophomore year. Admission into the MMEDIC Program includes acceptance into medical school conditional upon the student's satisfactory performance during the junior and senior years at the College of Liberal Arts.

Students accepted into the Program complete their junior and senior years of college in two calendar years, a factor that is important in order to ensure students the time to mature intellectually and socially while obtaining a general liberal arts education for the profession of medicine. During their junior and senior years, students are given the opportunity to take a number of specially designed "modular courses" which serve as the interface between premedical and preclinical education. Modular courses have been developed and taught jointly by the faculties of the College of Liberal Arts and the School of Medicine. Satisfactory completion of these modules fulfills requirements for both the Baccalaureate and Doctor of Medicine degrees, and serves to facilitate the transition between premedical and preclinical medical education.

Modular courses provide students training in the basic medical sciences in ways educationally superior to similar courses normally taught during the first two years of medical school. The content of modular courses is enriched through input of both College of Liberal Arts and Medical School faculty, and the curriculum is decompressed by presenting it in smaller classes over a longer period of time using diverse instructional methodologies. These factors contribute to an educational atmosphere that is more conducive to students acquiring the essential knowledge during college necessary for a career in medicine.

Students indicated that their attitudes toward their remaining undergraduate education changed as the result of their participation in the MMEDIC Program. They did not need to select courses with a view toward amassing "desirable credentials"--a major concern of juniors and seniors.

Obtaining a well-rounded education became a priority for 95% of the students surveyed. Likewise, for the majority of students, the last two years of college were no longer thought of as a stepping stone to medical school (64%), or as a time to enhance one's chances of acceptance to medical school (89%). Another advantage of early admission, as reported by 97% of the students surveyed, is the elimination of the time commitment necessary to prepare for, and the pressure to do well on, the MCAT.

Ninety percent of the students felt that modular courses eliminated the redundancy often associated with traditional premedical/preclinical courses. The opportunity to take medical school offerings during their junior and senior years was seen as an advantage of the Program for all students (100%). Students, in general, felt these factors contribute toward a flexible curriculum of study (98%).

The flexibility of a student's program of study continues after his or her formal matriculation into the medical school. Students in the MMEDIC Program begin medical school with a decompressed first-year curriculum in a familiar academic setting where they have previously dispelled their doubts about being able to do medical school work. Having completed a number of basic science modular courses, MMEDIC students invariably have flexible schedules that include blocks of free time. Free time, a major departure from the traditional first year of medical school, represents a key element in unlocking the rigid and frequently stressful first year of medical school. With as much as one fourth to one third of their first-year schedule free, MMEDIC students have completed elective experiences without jeopardizing their performance in other first year courses.

Students have used portions of their free time to continue their academic or nonacademic interests. Students have pursued academic interests developed during college by teaching laboratory techniques in the premedical sciences, taking courses in other schools within Boston University, and continuing research previously begun in either the natural or social sciences. Similarly, students have returned to previously developed nonacademic interests. Elective experiences also serve as an interface between the basic medical sciences and clinical medicine just as modular courses serve as an interface between college and preclinical instruction.

BOWMAN GRAY SCHOOL OF MEDICINE

For Additional
Information, Contact: Nat E. Smith, M.D.
Associate Dean
300 South Hawthorne
Winston-Salem, NC 27103
(919) 748-2053

Bowman Gray faculty centered their concerns around six areas:

1. The collegiate experience: students should go to college to gain an education. Some of our otherwise apt medical students do not achieve an optimal general college education with resulting detriment to their subsequent personal and professional development.

2. Our difficulty in handling the information explosion seriously handicaps more optimal medical school experiences.

3. There is insufficient identification and documentation of the specificity, variety, and level of skills expected of the medical school graduate.

4. The incorporation of newer interdisciplinary topics is a recurring, vexing problem.

5. There is need to improve the teaching of skills in organizing and applying measures to prevent disease.

6. There is deep concern in occasional instances about faculty and student attitudes that are detrimental to the highest standards and traditions of medicine.

Bowman Gray's directions relating to the college preparatory and admissions level include greater diversity among admissions interviewers to increase the probability of recognizing noncognitive attributes; development of computer-assisted records to help document and subsequently relate noncognitive traits to future performance; and increased dialogue with undergraduate faculty in colleges in the immediate region.

The validity of the assumptions in the "Charges" booklet dealing with knowledge in the basic sciences and clinical disciplines was questioned. A massive effort to deduce a more precise number of essential concepts and attendant facts was questioned, as well as the implication that this would translate into clinical wisdom in decision making. A given fact at a fixed point of time can be useful to one physician with a patient. A second physician might well use another fact or concept to help the patient in question. The entire set of facts might not prove useful to a current student by the time he begins to practice. What one actually needs is command of sufficient concepts or facts to make hypotheses and then bring further observations and facts to bear on a sound solution.

How to achieve this constitutes a substantial portion of the agenda for Bowman Gray's Committee on Medical Education. One can reduce the mass of concepts and facts to a more manageable scope. One can stress the application of said concepts and facts as (1) reinforcement; and (2) demonstration of further the purposes of the acquisition of knowledge. Such instruction should be evaluated by several means other than testing of memory.

Five initiatives Bowman Gray reported are:

1. The faculty/student advisory system was revamped to help foster closer personal contact between new students and faculty members.

2. A studied effort is being made across clinical disciplines for increased personal contact between senior clinical faculty and clinical clerks. This is both to increase skills and to transfer positive attitudes toward patient responsiblities.

3. An Honors program for selected new students began in 1983. This program centers around faculty role models for new students. Its purposes include heightening interest in academic medicine; fostering a collegial perspective toward exemplary patient and professional relationships; challenging the talents of more students and faculty; and rewarding student initiatives.

4. A formal program in Medical Ethics and Human Values has been implemented. While this may not result in high ethical standards, it conveys the idea of faculty recognition of values and recognizes that students will have dilemmas.

5. Currently under faculty scrutiny is a revised evaluation and grading system that will recognize more categories of excellent student performance without grade inflation.

BROWN UNIVERSITY PROGRAM IN MEDICINE

For Additional
Information, Contact: Stephen R. Smith, M.D.
Associate Dean of Medicine
Box G
Providence, RI 02912
(401) 863-2894

The Brown University Program in Medicine is currently undergoing a reevaluation and reorganization of its curriculum. The curriculum is based upon a seven- or eight-year continuum, beginning with the first undergraduate year. This continuum, with three or four undergraduate years, has been in place since the inception of the M.D. degree at Brown for approximately two thirds of the students; the other one third enter after completing four years of college. The Brown Future Planning Committee has been charged to evaluate the undergraduate prerequisites for entrance into the medical program and the requirements of the M.D. degree.

The major institutional concerns at Brown University are:

1. Establishing college prerequisites that take into account the level of education of today's high school graduates and that provide the maximal amount of flexibility for the premedical student.

2. Integrating the undergraduate educational experience with that of medical education to maximize learning, increase problem solving ability, and avoid duplication.

3. Defining a core medical curriculum that is learnable and, if mastered, will assure the basic first level of quality for graduating students.

4. Developing a curriculum that will allow students to develop concepts of self-learning and self-evaluation that will continue during their years as practicing physicians.

5. Developing a curriculum that allows students the opportunity to pursue a scholarly effort either in a medically related discipline or in some aspect of their undergraduate work.

6. Including a significant ambulatory experience that exposes students to ambulatory care issues and the concepts of continuity.

The Brown University Program in Medicine is developing a curriculum to be entitled "Program in Liberal Medical Education." This program will be based on all students enrolling in a seven- or eight-year continuum that will include their undergraduate and medical education. The Liberal Education Program will maximize the University's resources through optimal integration of both premedical and medical years. There will be a decrease in requirements in the undergraduate years to reflect the level of math and science that students have experienced in high school. This will allow for more flexibility and a broader education without reducing the needed background for more advanced scientific study. Along with the reduced requirements for math and science could come an added requirement for problem-solving courses that could be taken in any one of several disciplines and would promote this aspect of a student's education.

BROWN PAGE TWO

Brown University is further developing its continuum into "The Program in Liberal Medical Education." In the curriculum, all students would be enrolled from their first year in undergraduate school and would have fewer basic requirements. Taking into account their high school education, the program will allow for a scholarly effort somewhere along the continuum. It will provide a unique opportunity for integration of the premedical and medical years, student self-directed learning, and for the faculty to be involved in an exciting curriculum with close student contact. In addition, the program has the potential to improve the understanding of students through experiential learning in their undergraduate years.

Through a required ambulatory experience, the Program in Liberal Medical Education can provide the concepts of human values and the social aspects of the physician's role. This would be in a manner and time that the material will not be in conflict with the basic clinical medical knowledge. Faculty would only need to affirm the importance of the nontraditional medical factors in the clinical setting. A learnable, identifiable core of material will be needed, as well as a commitment of the power structure to implement change in the face of resistance. Through this type of curriculum a well rounded scholarly physician with improved skills for either scientific study or clinical care can be developed.

UNIVERSITY OF CALGARY FACULTY OF MEDICINE

For Additional
Information, Contact: John S. Baumber, M.D., Ph.D.
Associate Dean for Education
3330 Hospital Drive, N.W. Room G348
Calgary, Alberta CANADA T2N 4N1
(403) 284-6076

The University of Calgary Medical School has a three-year continuous curriculum with the first two years organized in body systems and the third year as a fairly traditional clinical clerkship. The body systems courses are preceded by a short introductory course (four weeks), which is divided into two parts. Part A deals with medical problem solving using case histories and small groups; Part B is a review of cell biology and is more disciplinary in nature than the systems courses that follow.

All courses are multidisciplinary, integrated, and clinically oriented and the scheduling, teaching, and evaluation of these courses are the responsibilities of a chairman and subcommittee. The learning of clinical skills begins within the first three weeks of entry into the school with communications skills, physical examination, and clinical correlation with the systems courses. These are small group, preceptor-based sessions.

Throughout the first two years, five continuity courses comprising Planning Prevention, the Infant, the Young Child, the Family, and the Declining Years cover life experience from conception to death. They consider the impact of illness and disease in the broader area of the individual, the family, and the community. They are used to present psychosocial, ethical, moral, legal, nutritional, epidemiological, and behavioral issues in the context of Community Health.

Formal, didactic learning experiences are scheduled for 24 hours a week. The balance is set aside for independent study time and elective opportunity. All evaluations are criterion-referenced and a satisfactory/unsatisfactory system is used. No class rankings or GPAs are kept. Students are given problem-oriented study guides for each course, which cover the content of each particular course, and no attempt is made to cover all the content in formal learning experiences.

In the final clinical clerkship year students spend 12 weeks in Internal Medicine, eight weeks in Surgery, and six weeks in each of Psychiatry, Obstetrics and Gynecology, and Pediatrics, with ten weeks of elective time. An elective in Family or Emergency Medicine is encouraged (the majority of the students take one or both voluntarily).

Some of the insights provided by Calgary follow:

1. College science courses. A rigid premedical course of studies is not essential; what is of more importance is that the student should have demonstrated intellectual competency or excellence in whatever field he brings to medicine.

2. Modifications in MCAT. Calgary is not convinced that the MCAT does indeed assess the adequacy of preparation. The MCAT could be more relevant to the objectives of medical school programs if it used more of a problem-solving format and decreased the number of items that rely on recall of facts.

3. A broad baccalaureate education. The assumption that a broad baccalaureate degree provides a broadly educated student is by no means a given. There are many ways to achieve an interest in society, the arts, literature, etc., without taking formal courses. In the admissions committee's view, establishing criteria to define breadth of education would be difficult.

4. Reducing clerkships. The surgery rotation might be reduced and the majority of surgical training placed in postgraduate programs. As a minimum, the undifferentiated physician should be able to assess the surgical patient and manage shock and trauma.

5. Improving clerkships. Students' learning of essential knowledge during clerkships could be achieved by increasing preceptor involvement in the supervision of learning--especially in the provision of specific clerkship rounds, which should be presented in a problem-solving mode. The clerks should be protected from too much service work without direct assessment by preceptors.

6. Clerkships in ambulatory settings. Students and residents in general seem to prefer the excitement of an in-hospital experience to the more mundane aspects of primary care. To use ambulatory care settings more for teaching requires good teachers, who are engaged in full-time practice (i.e., part-time clinical faculty), and who are recognized as being potentially good role models. They must be adequately financially recompensed for the time lost in teaching. A quality experience in ambulatory care should be a mandatory component of the clerkship program. This not only implies a commitment by the faculty but also a funding priority of the school that will realistically compensate rural and urban primary care, part-time clinical faculty for the loss of income incurred as a result of teaching.

7. Use of external examinations. Many faculties in Canada rely on the Medical Council of Canada (MCC) Qualifying Examination and to a lesser extent on the National Board of Medical Examiners certification sequence as a standard of measurement of students' achievement of the essential knowledge for their general professional education. Calgary does not use National Boards Part I or Part II. Calgary suggests dropping Part I and using one final external examination like the Medical Council of Canada Qualifying Examination. It would appear that the traditional, artificial division between basic science years and the clinical years is reinforced by the National Board Part I examination.

8. Developing skill in independent learning. Give the students time to learn by providing generous amounts of independent study time and elective opportunity during each week and limiting formal didactic teaching to 24 hours a week (roughly half the time available). The stimulus for independent study comes from the enthusiasm of the teacher and the engaging of minds in personal tutelage and expectation. It is more important for a student to achieve his own potential with respect to institutional expectations rather than pass examinations in competition with his peers.

9. Developing skills in analysis and criticism. Calgary uses case histories, clinical pathological conferences, and clinical problems to stimulate literature reviews. In the clerkship students are expected to prepare at least one case in depth. Small groups also study flawed epidemiological papers. A four-week Integrative Course with students in small groups will engage in patient

problem solving utilizing the case problem books (Barrows), simulated patients, and microcomputers. State-of-the-art lectures given by faculty during systems courses are designed to stimulate intellectual curiosity and literature review.

10. Promoting informal learning. Ready availability of library and other instructional resources, together with easy informal contact with faculty, is vital. Training in small group skills at an early stage in the curriculum encourages students to use this format for self-education groups run by the students themselves. Clearly stated objectives permit the student to use a variety of formal and informal devices to attain the objectives. Frequent learning evaluations allow the independent learner to measure progress against faculty expectations. The noncompetitive philosophy produces an atmosphere of cooperation that fosters self-motivated learning.

11. Developing concern for patients. Provision of faculty role models who demonstrate concern for patients is important. Students are especially sensitive to the manner in which the faculty member treats the patient. The tradition of a formal "thank you" by a class spokesman to patients perpetrates the concept of respect and concern for the person. More "team" presentations involving allied health professionals would stress the total dimensions of patient welfare.

12. Reducing unnecessary stress. The noncompetitive philosophy removes a major source of stress. The faculty adivser system can be useful in certain cases. Also helpful are the Student Affairs Office and coordinator, the orientation program, the "buddy" system among students, and the student offices. Involvement of students on faculty committees makes faculty sensitive to both individual and collective student views and problems on a more personal level. More learning evaluations reduce the stress associated with certifying evaluations by familiarizing the student with the format, and by allowing the student to gauge better his knowledge against faculty expectations. Coffee breaks during evaluations are a simple and humane stress-reducer. Emphasis on "remediation" after an unsatisfactory performance helps the student to come to terms with the situation and removes the stigma of "failure." Provisions of adequate independent study time to master the amount of information expected greatly reduces the "pressure of time" stress associated with medical studies. Flexibility within the program to permit the student to take some time out is a psychological "safety-net." Financial support for students in need would reduce a major source of stress.

UNIVERSITY OF CALIFORNIA, LOS ANGELES, SCHOOL OF MEDICINE

For Additional
Information, Contact: Martin A. Pops, M.D.
Associate Dean for Curricular and Student Affairs
Los Angeles, CA 90024
(213) 825-6281

The UCLA School of Medicine is addressing problems in the following areas.

Admissions. UCLA is focusing attention on the best methods of selection, the appropriate criteria for selection, and communication of the desired qualities and preparation they seek in applicants. They hope to indicate through the proper channels the high, but broad-based standards by which their admissions committee makes its decisions--high academic performance, humanitarian attitudes, moral character, and strong liberal arts training as well as adequate scientific preparation. Furthermore, members of the premedical advising office have been invited to attend admissions committee meetings to improve the link between prebaccalaureate and medical education. Finally, the UCLA Admissions Policy Committee, in cooperation with the Psychology Department, is developing an instrument to identify desirable traits in applicants. Half its class will be admitted according to that profile; the other half will be admitted through traditional channels. The subsequent performance of students in these two groups will then be compared.

Curriculum. With the objective of maintaining the integrity of the basic sciences, UCLA is redesigning the first two years. "Return to Basics" courses are planned to enhance student synthesis of information, improve appreciation for the basic sciences as a foundation for the clinical sciences, and bring basic science and clinical science faculty together to discuss applications of basic sciences to the practice of medicine.

Although UCLA states that curricular revision is necessary and desirable and that a stagnant system of medical education in the dynamic and exciting art of medicine would be inappropriate, they also recognize the various obstacles that often lie in the path of that goal. Changing and limiting the course content and shifting the emphases of instruction will require a courageous effort on the part of faculty. Faculty are increasingly responsible for their own support; to encourage a shift of their time and interest away from clinical service and to the teaching of medical students will require that their teaching efforts be given increased weight.

Teaching and Teaching Methods. Traditional methods of teaching requiring memorization of a vast quantity of detailed information should be deemphasized and methodologies for accessing, controlling, and keeping up with information should be developed and instituted. UCLA is considering the integration of information management techniques into existing medical school courses and the establishment of a learning laboratory to enhance computer literacy and information gathering techniques and seminars on database creation and online searching. These changes will require better communication and working relationships between the faculty and library/information professionals. Faculty will need to have confidence in the concept that information gathering skills can, in fact, replace the memorization of specific details before they will implement changes in their courses. Curriculum content can then stress understanding broad and essential fundamental concepts and processes rather than a multitude of detail. UCLA notes, however, that a significant impediment to their ability to achieve these changes is that today's tight budgets make it difficult to purchase modern educational technology.

The greatest consequence of the project, according to UCLA, is that it has expanded, given focus to, and strengthened their reexamination of medical education. They see this self-examination as a valuable exercise that will result in improvements in the environment in which their medical students will abide and better prepare themselves for the joy of lifelong learning and dedication to the biomedical sciences.

UNIVERSITY OF CALIFORNIA, SAN DIEGO. SCHOOL OF MEDICINE

For Additional
Information, Contact: Andrea Hattersley
Office of Student Affairs
School of Medicine
University of California, San Diego
La Jolla, CA 92093
(619) 452-3700

The Health Professions Program at the University of California-San Diego is part of a $23 million experiment in premedical and preclinical education funded under the Commonwealth Fund's Interface Program. Its purpose is to improve the interaction between premedical and preclinical education. The program at UCSD is one of eight in the country; others have been established at the University of Chicago, the University of Rochester, Boston University, Brown University, Duke University, Dartmouth College, and Johns Hopkins University. Each institution uses a variety of approaches in trying to address some of the issues in premedical and preclinical training. The following perspectives and conclusions concerning these aspects of the general professional education of the physician are based on the yearly reports of the programs at these institutions with particular emphasis on the program at UCSD.

Most of the eight institutions involved in the Interface Program have used faculty from both the colleges and medical schools. Most have introduced new courses and have advanced advising. Several institutions have early acceptance, but not early admission; these are not accelerated programs.

The focus of the Health Professions Program at UCSD is on the undergraduate college phase. The goal, in general, is to broaden the academic and experiential preparation of students in the health professions. Faculty from the general campus and the medical school teach the students. They serve on the steering committee of the program, as positive role models, and as faculty advisers for the students' field work, which is a very important and large part of the program. Early academic advising is offered to premedical students since it is crucial that they be reached early with as much information about the process--both in terms of the training and the eventual professional activities--that they are going to face. A weekly newsletter and a speakers' series that addresses various health professions, medical issues, and medical specialties are facets of the program.

The program at UCSD is the youngest of the eight; the oldest has been in operation for seven years. Thus, it will be sometime before data on what the students look like when they get out into practice can be collected. The preliminary results have been frustrating. The first cohort at UCSD was graduated in June 1982. All of the students were successful in gaining admission. They went through the traditional process of selection. Their experiences indicate that as long as the selection process privileges grade point averages and MCAT scores applicants are going to structure their educational pursuits around the goal of obtaining high grade point averages and MCAT scores. A lot of the demand for breadth is mainly lip-service. To the extent that it is not lip-service, it is a demand

---

This summary was drawn from testimony presented by Andrea Hattersley at the AAMC Western Regional Hearings held January 27-28, 1983.

for super premedical students. Now they have not only to excel in the natural sciences and quantitative areas, but they have to excel in everything. Concern focuses on the psychic cost of those demands and on what they do to the "premedical syndrome."

The program, however, has been very successful in developing clinically useful traits. These students engage in cooperative modes of behavior. They form study groups and cooperate in contrast to the competitive, individualistic behavior of the stereotypical premedical student. They also develop critical analytical skills through the courses that are offered. These courses span the disciplines--from natural and social science to the humanities--with several particular interdisciplinary courses.

Chances are that students in the program will have difficulties when they matriculate in medical school. Those who have begun medical school, after three or four years of being groomed and sensitized, are finding it to be brutal. A lot of the traits that they have been nurturing during their college years will atrophy or be found to be counterproductive to what medical schools demand.

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, SCHOOL OF MEDICINE

For Additional
Information Contact: Alan Goldfien, M.D.
Associate Dean
513 Parnassus Avenue Room S-221
San Francisco, CA 94143
(415) 666-2346

Following are some of the problems UCSF has experienced with some recommended solutions:

1. The basic science lecture format fosters passive learning of fragmented facts with little room for knowledge by self-discovery and reasoning.

   Recommended Solutions: Teach in active, small groups. Faculty need adequate incentives and reinforcement for their commitment to teaching.

2. Examinations evaluate the student's ability to retrieve factual "bits." They encourage memorization rather than understanding of information.

   Recommended Solution: Orient examinations toward problem solving.

3. Unnecessary repetition and lack of integration in the first two years.

   Recommended Solution: Improve communication.

4. Premedical requirements lead to domination of undergraduate curriculum by the physical sciences and often do not include experiences that enhance problem-solving skills.

   Recommended Solution: Admissions Committee should define and publicize core premedical requirements and evaluate for same.

5. Reading, writing, and other communication skills need greater emphasis in college and are essential for M.D.

6. Independent study skills are needed in premedical school and unstructured learning and interactive class time in first two years of medical school.

   Recommended Solutions: Develop appropriate premedical requirements; replace 30-50% lecture time with active learning formats; develop projects and problem sets that require students to obtain information quickly and efficiently from the library, the computer, and experts in the field; examinations and evaluations should emphasize conceptual understanding based on factual knowledge.

7. Teaching fundamental clinical skills.

   Recommended Solution: More supervision perhaps with a single primary care physician as preceptor over second, third, and fourth years and possibly practical clinical examinations.

8. Emphasis on "the finding" and not "the patient."

   Recommended Solution. Preceptors and housestaff should provide good empathetic role models.

9. Student stress.

Recommended Solutions: (a) Support groups of students and physicians at all levels (seniors and juniors could be excellent role models); (b) establish atmosphere of cooperation and hard work; and (c) emphasize exercise, relaxation, and healthful living with scheduled time and appropriate facilities for these activities.

10. Student cynicism.

Recommended Solutions: Recognize personal and social responsibilities of students to their families and communities; (b) faculty should encourage students to accept responsibility for their individual freedom and autonomy and schools should provide counseling and guidance to assist in this endeavor; and (c) establish an ongoing elective to introduce first- and second-year students to physicians whose careers represent a commitment to community service.

CASE WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Robert Griggs, M.D.
Professor of Medicine and Associate Dean
for Student Affairs
2119 Abington Road
Cleveland, OH 44106
(216) 368-3499

Case Western Reserve's perspectives on and conclusions concerning the general professional education of the physician and college preparation for medicine follow.

Medical education has not kept pace with the rapid changes in the practice of medicine and the role of the physician. With the introduction of antibiotics in the late 1930s physicians acquired the ability to alter the course of disease and went beyond their former primary role of diagnosing disease and providing support and comfort during the course of illness. Now, they must integrate a massive, complex, and expensive array of knowledge and technology for the prevention, diagnosis, cure, or amelioration of disease. Frequently criticized as applied scientists, concerned only with disease, but never with the patient, doctors of the past were primarily taught to accurately recognize, describe, and identify human disease. Although this continues to be important, the emphasis now and in the future must be on teaching the student to prevent, manage, and cure disease. The dilemma in medical education today and for the future revolves around the problem of teaching the student to care for patients as individuals and members of a society in an era in which the necessary knowledge base and technology are huge and will undoubtedly continue to expand.

Because of these concerns and pressures from within medicine and from the public to provide medical education emphasizing both humanistic care as well as the best and latest in knowledge and technology, the faculty of Case Western Reserve University School of Medicine have continued to review the content and structure of the medical curriculum. Their recent focus has been a review of the teaching of clinical science with the goal of understanding its role and future direction in the training of medical students in the environment of a science and technology oriented medical school and tertiary care teaching hospitals. They continue to believe that the development of the student's clinical and interpersonal skills and their application to patients and problems has to be stressed in all four years of medical school. A student's first-year clinical experience includes introduction to prenatal, perinatal, and infant care and the development of the skills and attitudes necessary to help and care for the patient and family, who are undergoing what is usually a happy and welcome interaction with the health care system. In view of the aging population of the United States, they are considering introducing the student to the care of the elderly patient, possibly a resident of a long-term care facility. The second-year clinical experience continues with the care of pediatric patients. In these first two years of clinical experience, the emphasis is on the personal skills and attitudes of the student in working effectively with patients and other health care providers.

This summary was drawn from testimony presented by Dr. Robert Griggs at the AAMC Northeastern Regional Hearings held May 5-6, 1983.

CASE WESTERN RESERVE PAGE TWO

A variety of problems with the clinical clerkship have been identified. In contrast to the clinical experiences of the first two years, which are provided in a relatively uniform fashion, clinical clerkships are offered at affiliated hospitals and vary considerably in content, emphasis, and quality. Responsibility for this educational experience has been delegated to the service director, clerkship director, faculty, and house staff of the affiliated hospitals. There is a strong and increasing tendency in these clerkships to lose sight of the patient. The role of the attending physician in focusing on the patient has diminished considerably, overwhelmed by the increasing technology, the people who control and provide the technology, and the house staff, fellows, and faculty who too often are as misdirected as the student. Case Western Reserve medical faculty strongly believe that the focus of the clerkship should be the patient and should refine and build on clinical skills introduced in the first two years so that the focal point of medical education, the patient, will always be in sight. Further, they believe that an emphasis on the patient can be maintained while the scientific and technological aspects of medicine are being learned.

Problems with basic science education at Case Western Reserve School of Medicine have been extensively discussed. Faculty identify the problem as not only involving too much data and material that can be presented to, digested by, understood, and utilized by the student, but also the need to present information in the context of clinical problems. The basic science of modern medicine goes beyond the classic sciences of anatomy, physiology, pathology, etc. and includes the basic science of surgery, internal medicine, pediatrics, etc. and all their subspecialties. They have been addressing this problem in their organ system oriented curriculum for the past 30 years. They are considering, however, the need for revisions that would allow more teaching of modern basic science after the student has had some full-time experience with patient care. A curriculum format that would move the core clinical clerkship earlier in the curriculum to allow a postclerkship period of combined clinical experience and didactic sessions involving science and technology as directly applied to patient care is under consideration. Vigorous discussion of the content of preclinical medical science versus postclinical medical science is underway at the present time. They cannot offer a solution to these problems at present, but feel that they warrant extensive discussion and careful consideration.

UNIVERSITY OF CHICAGO PRITZKER SCHOOL OF MEDICINE

For Additional
Information, Contact: Frank W. Fitch, M.D., Ph.D.
Associate Dean for Academic Affairs
950 East 59th Street
Chicago, IL 60637
(312) 962-6755

The University of Chicago Pritzker School of Medicine's perspectives on and conclusions concerning the general professional education of the physician and college preparation for medicine have been formulated in the course of ongoing efforts by a council of faculty and students to improve medical education. Since 1970 this council has reviewed the effectiveness of individual courses; monitored the relation of individual courses to the overall educational program; and provided an overview on medical education at the University of Chicago.

The common goals of the medical curriculum are:

1. To admit students with excellent intellectual credentials from broad social and educational backgrounds, requiring only the essential sciences.

2. To prepare these students for a lifetime of medical practice by providing a strong base in the biological sciences and a structured apprenticeship in clinical medicine.

3. To provide educational flexibility by allowing students four to six quarters of elective time spread over the four years of the degree program.

4. To encourage participation in research as a means to prepare the student for a lifetime of practice, where self-education is essential and high personal standards of patient care are the only bulwark.

5. To nurture those who wish to promote the application of biological sciences to medicine by personal involvement in research and through a large combined M.D./Ph.D. program.

The initial curricular structure at the University of Chicago Pritzker School of Medicine emphasized sharing of medical science courses with graduate students, interdepartmental responsibility for individual courses, and the delegation of responsibility for productive use of elective time to the students. In 1976, they instituted an experimental program called Arts and Sciences Basic to Human Biology and Medicine (ASHUM) under the sponsorship of the Commonwealth Fund to integrate the last two years of college with the first two years of medical school. This program resulted in the organization of some 16 special courses integrating the humanities and the premedical and medical sciences. The outcomes of this continuing experience include:

1. Considerable expansion of courses in and discussion of the human qualities of medicine, directed to assisting the medical student's adjustment to medicine,

---

This summary was drawn from testimony presented by Dr. Harry A. Fozzard and Dr. Godfrey Getz at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

to promoting thoughtful and balanced relationships with patients, and to encouraging consideration of the social role of medicine.

2. Gradual return of responsibility for most medical sciences courses to departments, where effectiveness is rewarded in the usual academic manner.

3. Increased structure in elective courses for students in recognition that effective courses require major faculty effort and resources.

4. Great respect for the value of a strong combined faculty-student council to promote continued change and growth in medical education within their institution and realization that the faculty and the students share their fundamental educational goals.

The future goals of the University of Chicago Pritzker School of Medicine are strengthening the crucial ties between the biological science and the practice of medicine, and building with students from the broadest possible background a new role for medicine in our society, based on clinical competence, but recognizing that physicians' social role exceeds that.

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE

For Additional
Information, Contact: Jack Nolte, Ph.D.
Assistant Dean for Curriculum
Box C303, 4200 East 9th Avenue
Denver, CO 80262
(303) 394-8262

A considerable amount of self-evaluative activity has taken place at Colorado over the last two years independent of the project. In the Fall of 1981 the school of medicine was reviewed for accreditation and this review was preceded by an exhaustive self-study. In February 1982 a retreat involving faculty and students was held; this meeting yielded a series of recommendations for the reorganization of the basic science curriculum. An August 1982 student retreat produced a further series of recommendations involving financial aid, student support services, and methods of evaluation. Colorado has sought to involve faculty and students in the GPEP project at multiple levels; the booklet, "Charges to the Working Groups," was distributed to members of the curriculum committee, faculty senate members, and student representatives. Perspectives on and conclusions about the general professional education of the physician follow.

The present curriculum for the first two years is primarily organized in a lecture-laboratory format, with students working in small groups for most laboratory exercises. In addition, an Introduction to Clinical Medicine sequence of courses, mostly taught in small groups, spans the first two years. Clerkships in the third and fourth year are principally done in Denver, but there is increasing participation in clerkships at area health education centers.

The attitudes of a significant number of students are a cause of concern. These students are worried about the debts they have accumulated in the course of pursuing their medical education, about the shrinking numbers of residency positions, and about the possibility of becoming part of an oversupply of physicians. One positive result of these attitudes on the part of students has been more willingness--more than at any other time in the last ten years--to question the process of medical education and to express their frustrations with the process. A relatively small minority of faculty is devoted to teaching; they feel, to a great extent, unrewarded for their teaching efforts. This attitudinal climate has presented Colorado with the need and opportunity to take a step backwards and to reexamine a number of their basic premises.

In terms of future activity, inquiries about the philosophy and details of the admission process have led to the recent appointment of a task force to study this matter. This, in turn, will necessitate discussion of the school's educational philosophy and goals. The content and assumptions of the curriculum are gradually being examined. Objectives for core courses will be centralized and collated. Content of clinical clerkships is being explored in detail in a project that began in June 1983.

This summary was drawn from testimony presented by Dr. Jack Nolte at the AAMC Western Regional Hearings held January 27-28, 1983.

COLORADO PAGE TWO

The processes used in the current curriculum at Colorado are evolving. A problem-solving track through the Introduction to Clinical Medicine sequence of courses exists now, and alternate tracks through the two first-year courses are currently being implemented. New methods of evaluating both the content and process of the curriculum need to be explored.

UNIVERSITY OF CONNECTICUT SCHOOL OF MEDICINE

For Additional
Information, Contact: Carl F. Hinz, Jr., M.D.
Associate Dean for Academic Affairs
Farmington, CT 06032
(203) 674-2819

The University of Connecticut School of Medicine's participation in the project is part of a long-range review of their program in medical education.

In the course of this review several imperatives were identified as having influence on future educational planning:

1. The aging population and its health care needs;
2. The growing importance of ethical and legal considerations;
3. Economic pressures on and organizational changes in the role of physicians;
4. The revolution in computing and information management.

A questionnaire based on UCSM's original educational goals was submitted to a selected sample of students and faculty to survey their current views on these goals and the success of the institution in reaching them, as well as to stimulate interest in the project. As a result of this questionnaire, UCSM reaffirmed their commitment to the following precepts: (a) the validity of a sound basis in bioscience and human behavior for medical practice; (b) the primacy of skills in the case method; (c) the desirability of an experience that emphasizes analysis and problem solving in a collegial environment with student-initiated learning.

Respondents to the questionnaire also identified certain shortcomings in the present program. Instruction and evaluation increasingly focus on facts rather than basic principles and their use. Instruction is predominantly teacher-centered and learning experiences that involve interaction and independent, problem-oriented student learning are limited. Finally, the quality of experience, supervision, and guidance in clinical instruction in the diffuse network of clinical sites is uneven.

Among the major concerns expressed by UCSM are:

1. The inflexibility of educational programs in changing and adapting to new trends and imperatives;
2. Preclinical teaching, which is increasingly teacher, rather than student, oriented and which focuses excessively on detailed facts rather than fundamental principles;
3. Clinical teaching, which is largely apprenticeship in nature, uneven, and heavily oriented to specialty rather than primary care medicine; and
4. Shrinking resources for medical education and powerful competing priorities.

CREIGHTON UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Beverley Mead, M.D.
Associate Dean for Academic Affairs
2500 California Street
Omaha, NE 68178
(402) 280-2876

Following are some of the viewpoints expressed by Creighton faculty and students who discussed issues contained in the GPEP "Charges" booklet.

1. Students feel the premedical curriculum should be broadened; many regret having concentrated too much on science.

2. CUSM uses MCAT results as part of minimal standards for accepting students and agrees that a national test is needed and that it needs to be under continuous revision as knowledge is changing. Students feel the current MCAT is quite fair.

3. After some debate, faculty agreed that no disciplinary clerkships could be reduced or eliminated. Students believe it might be desirable to drop four weeks of the eight-week psychiatry junior clerkship and substitute four weeks of Family Practice or an ambulatory clinic.

4. If required senior courses are recreated, some experience on an ambulatory service would have many supporters, both faculty and students.

5. Medical economics, business methods, office management, and record keeping should be taught and greater emphasis placed on medical communication, both oral and written, medical/legal issues, and the art of physical diagnosis.

6. National Boards do not influence faculty's structuring or teaching of courses. Both faculty and students would welcome more "creative testing" such as oral or essay-type examinations.

7. CUSM faculty feel they have too much didactic teaching with little to stimulate independent study. Facts are memorized but concepts may not necessarily be understood. Some basic science subjects may be indoctrinated into students in "boot camp" fashion--"Learn this! Do this!"--without clear correlation to the skills of diagnosis and treatment.

8. Medicine, surgery, psychiatry, obstetrics-gynecology, and pediatrics are the clerkships that provide the greatest opportunity for learning fundamental skills.

9. Students' acquisition of fundamental skills during clerkships might be facilitated by the use of "hired patients," for teaching such skills as pelvic examinations. Use of checklists and appropriate audiovisual aids should also help in acquiring fundamental skills.

10. In an ambulatory setting, working with an experienced physician, the student should have the opportunity for better role modeling in providing preventive care.

CREIGHTON PAGE TWO

11. Involving students in research projects working with, or under the supervision of faculty, stimulates students' intellectual curiosity.

12. Both students and faculty would like to see more Socratic dialogue, small group class discussions, and informal "bull sessions."

13. Students acquire bad habits from faculty who approach patients impersonally and are more disease-oriented that patient-oriented.

DARTMOUTH MEDICAL SCHOOL

For Additional
Information, Contact: Stanford A. Roman, M.D., M.P.H.
Associate Dean for Academic Affairs
Hanover, NH 03756
(603) 646-7509

In its testimony before the project panel, Dartmouth emphasized the continuum and the interface of college preparation and medical education. Their overriding concern is that the liberal education of the college undergraduate has today become a lockstep, set to the drumbeat of the current hard-science requirements for admission to medical school. By this process, their students are overloaded with scientific facts, but too often unfamiliar with the methods of scientific inquiry. A science major who must also satisfy the college's language requirement and its distributive requirement can then elect only 12 other nine-week courses in his entire four years in order to acquire real depth and breadth in the humanities and social sciences to become sophisticated in quantitative biology. The student who chooses a nonscience major is obliged to take a minimum of 10 courses in that field and can elect only three courses in the entire four years in order to gain both a degree and entry into medical school.

As a result, 78 percent of their premedical students, despite exhortations to the contrary, major in biology or chemistry.

Dartmouth faculty firmly believe that the remedy for this situation lies not in weakening science requirements, but in redefining them; that the requirement of detailed knowledge in the hard sciences, appropriate for future graduate students in those fields, should be reduced to make way for a fuller understanding of physical laws and the laws of probability and of the methods and the philosophy of science. They enthusiastically support the view of David Saxon and others that science, taught in this way, is "an indispensable part of the liberal arts curriculum." The future physician will need a greater than average depth of understanding of its workings, but not a different philosophy.

These things should be achievable in a smaller number of required courses, or at least in fewer curricular hours. If time can thus be made available for a broader academic preparation, they urge that its utilization be guided much less by rigidly specified nonscience course requirements than by a clearer definition of the qualities of intellect and experience they seek in medical school applicants. Their records as scholars should be broad enough to have included several significant courses within the fields of literature, philosophy, religion, history, the classics, foreign language and culture, and the social and behavioral sciences.

Beyond this, they would expect applicants to have acquired, through experience in or out of class, a range of competencies. They should, before applying to medical school, be able to do the following: (1) demonstrate superior

---

This summary was drawn from testimony presented by Dr. Thomas Almy at the AAMC Northeastern Regional Hearings May 5-6, 1983.

ability in both English composition and formal oral communication; (2) make efficient use of the library and other learning resources and of modern methods of data management; (3) derive logical conclusions from observed facts, making appropriate use of the principles of probability and statistics; (4) approach ethical problems in a sound and systematic fashion; (5) interact successfully with others, under circumstances requiring understanding of, and sensitivity to, their needs and values; and (6) use available time efficiently, and function effectively under stress.

Dartmouth faculty submit that these competencies are developed both in and out of the classroom and, with rare exceptions, cannot be measured by the grade point average of a given student. They consider them relevant to the qualifications of any student to enter into the study of medicine. Therefore, they should be evaluated for all applicants by documentation supplied by premedical advisory committees and by requiring the student to present evidence of his competency in these respects in answers to specific questions on the application form. In consequence, these qualities will have become part of the basis for the decision to interview an applicant, which otherwise is too heavily influenced by small and not significant differences in the grade point average. The evidence presented by the applicant can then be regularly included in the agenda of the interview.

They recommend, as further evidence of competency in original thought and expression, that an essay be required as part of the MCAT. If the assigned topics of such essays should require integration of learning derived from multiple academic disciplines, they would reveal not only the level of writing skills, but also the intellectual breadth and depth of the candidate. Evaluation of such essays should be made not by scholars of high standing in restricted disciplines, but by clinical faculty members or broadly educated lay persons.

A further quality that should be developed at the college undergraduate level is the capacity to learn from field experience and to combine work, service, and scholarship. This often cannot be clearly estimated from the students' record of extracurricular campus activities, casual volunteer work, or entry level jobs. Premedical advisers should encourage students to undertake supervised independent study or "undergraduate internships" in which their work performance and capacity to learn on their own are responsibly documented. From these ratings and the students' oral and written terminal reports, their capability for learning from personal experience can be confidently evaluated. Otherwise, the level of these qualities is best evaluated through close working relationships between admissions committees and premedical advisers at major colleges.

Finally, to achieve the requisite degree of freedom in choice of undergraduate learning experiences, medical schools should encourage expansion of the practice of early assurance of admission for qualified candidates, as well as of delayed entry into medical school after one or more years of postbaccalaureate study and field experience. Both of these practices have favored admission of a higher proportion of nonscience majors and of students who have gained greater maturity and intellectual breadth.

EAST CAROLINA UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Paul R. Mehne, Ph.D.
Assistant Dean for Curriculum and Student Affairs
Greenville, NC 27834
(919) 757-2202

This submission was derived from the school's recent intramural review and from discussions of the AAMC "Charges" booklet. The following views were among those expressed.

1. Entering medical students often exhibit difficulty in interpreting data to elucidate fundamental principles and tend to be intimidated by solving problems that draw on analytical biology. Faculty recommend better college preparation in areas such as mathematics through calculus, logic, epistemology, and philosophy; students recommend biochemistry and comparative anatomy.

2. Faculty and students agree that the East Carolina University medical school curriculum provides an appropriate introduction to the basic sciences. Students express concern with the apparent emphasis on didactic teaching and memorizing of facts.

3. It is our belief that faculty must present facts necessary for clear understanding of essential concepts. Each instructional block should amplify application of concepts through conferences, clinical correlation, and case presentation. Basic science concepts are reintroduced in fourth-year electives. A problem-solving focus should begin with case presentations in the basic science years. Emphasis on quality training should begin at this level. Later, clinical problem solving must be learned and broadened in both ambulatory and hospital settings. Faculty can develop skills in analytic thinking by practicing problem solving in the classroom and laboratories.

4. Third-year clerkships and fourth-year required selectives should provide students with clinical knowledge required of all physicians. It is of great concern that the National Residency Matching Program deadlines force premature choice of specialty.

5. Concentration of clinical clerkships on inpatient services reinforces acquisition of essential knowledge. Similarly, ambulatory clerkships provide opportunities for participation in continuity of care. Students will benefit if faculty have adequate time in both settings to teach and reinforce clinical problem solving. Faculty promotion and award of tenure should recognize such teaching contributions appropriately.

6. East Carolina's curriculum includes the following additional areas felt to be essential: ethics, medical jurisprudence, medical economics/comparative health care systems, public health, preventive medicine, epidemiology, and computer technology.

7. Balancing personal growth and development with factual knowledge receives insufficient attention in all medical schools. Furthermore, faculties do not always stimulate students' curiosity, intellectual drive, and imagination as well as they might. Faculty should allow themselves to be challenged and to emphasize for students that the only inappropriate question is the one contemplated, but not asked.

8. Students should be encouraged to compete with themselves, not against each other. There should be acknowledgment of good work and good thinking. Grade consciousness should be discouraged.

9. The East Carolina faculty is fairly sensitive to the emotional stresses of its students, perhaps a factor of its small student body. The faculty believe that student stress should be addressed by deemphasizing fear techniques; by treating students with respect; by anticipatory guidance; and by assuring students time for rest, relaxation, and family concerns. This school supports a student organization on "Student Health and Effectiveness," which operates independently of the faculty to address student impairment.

10. Concern for the welfare of patients is developed primarily by the attitudes of faculty. It is inhibited by disparaging remarks; by the use of first names and other negative labels; and by placing other work above patient care. Consistent attention must be given to the primary goal of the physician: the patient's well-being. Faculty must demonstrate that the treatment of disease should be secondary to the treatment of a patient with disease.

11. Entering medical students should be broadly educated people with the ability to use language in written and oral communication. They should be taught in an atmosphere which makes learning exciting and personally rewarding. Faculty should treat students as junior peers and encourage constant challenges and critiques.

12. Greater attention must be given to articulating instruction given in different portions of the curriculum. Clinical faculty should communicate to basic science faculty those areas important for the student to know before entering the patient care section of the curriculum.

13. A most important responsibility is to present students with role models of teachers who recognize and practice the concept that the proper care of the patient is the only acceptable end point of medical education, and that one learns the basics in medical school, but becomes a physician in residency.

ALBERT EINSTEIN COLLEGE OF MEDICINE

For Additional
Information, Contact: Albert S. Kuperman, Ph.D.
Associate Dean for Educational Affairs
1300 Morris Park Avenue
Bronx, NY 10461
(212) 430-3371

Faculty from nine clinical and two basic science departments contributed statements in response to issues outlined in the "Charges" booklet. Some of their thoughts follow:

In the present institutional arena of academic education, time is the great limiting factor. There is so much to teach and so little time that what results are days filled with lectures, reams of rigid and unchallenged facts, with later assessment of retention by objective examinations suited only for computer grading. One solution would be a greater reliance on self-discovery, an absolute need for meaningful dialogue to test discovery, and more time.

Independent learning should have been taught from grade school through college, but most students entering medical school are unprepared to accept the responsibility inherent in independent study. From early childhood, their classroom experiences have created in most of them a habit of dependency in which teachers have made most of the decisions concerning their learning experiences.

Intellectual curiosity and motivation are vital prerequisites of independent learning. For the motivated student who comes to medical school with his intellectual curiosity intact, one probably need only provide the time, the appropriate setting, and an interested faculty member. For example, following selected lectures, small groups of students might meet with a faculty member who would encourage them to challenge the concepts presented, place those concepts in historical perspective, and assign to each student one or more relevant papers in the literature to be discussed at a subsequent meeting.

Excellence in medical practice requires qualities of intellectual curiosity, openness to new ideas and critical skepticism, all kept in dynamic balance. The selection systems of medical school, however, too often disregard evidence of these qualities in applicants. When students are admitted who have these qualities and attitudes, it is important that the system foster them. Faculty can contribute to this process by teaching students in the use of the scientific method, by a willingness to hear students' ideas and questions, and by avoiding information overload. Relevance of the material to be learned should be stressed.

Concern for patients' welfare is an essential characteristic of a physician; without it, good medical practice is impossible. Patients' needs must sometimes transcend a physician's own, but not at all times, or the physician risks burnout. Students need guidance in achieving balance in their professional life. They need to learn what is a comfortable distance between themselves and their patients.

Medical school curricula have failed to emphasize adequately disease prevention, relief of suffering, and assisting the afflicted in adapting to impairment. The faculty believe that new skills should be developed in effective clinical training focusing on different patient populations, such as those served by outpatient facilities, community-based treatment programs, and rehabilitation units. Since training in the clinical years emphasizes the care of hospitalized patients with acute problems, the student has almost no experience with patients who are well and in whom the effort is to keep them well.

GEORGE WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: L. Thompson Bowles, M.D., Ph.D.
Dean for Academic Affairs
2300 Eye Street, N.W.
Washington, DC 20037
(202) 676-3501

Faculty at the George Washington University School of Medicine took a somewhat different tack in considering and discussing some of the issues posed in the AAMC "Charges" booklet for two reasons: (1) George Washington University is a private institution without state funding that currently faces some extremely rapidly developing changes externally; and (2) the school of medicine had just completed a rather marked curriculum revision and an institutional self-study not long before the initiation of the GPEP project.

Revisions in the curriculum included such things as the integration of geriatrics into both basic science and clinical years; the addition of courses on reading and interpreting medical literature; the transferral of the emergency medical rotation from the junior to the senior year; the provision of augmented elected experience in biomedics; and the decompression of the curriculum in the first and second years.

In response to the challenges presented by the GPEP project, the dean for academic affairs requested the long-range planning committee to take the initiative in reviewing the issues. At first, the committee reviewed the data on the medical school's applicants and graduates. These data suggested that even though tuition is very high--a cause of considerable concern--few problems exist in attracting a highly qualified student body. However, the committee learned, for the first time, that though the medical school can attract highly qualified physicians-to-be, these men and women face formidable difficulties in obtaining residencies of their choice and in entering their chosen specialties.

With those considerations in mind, the committee considered whether or not admission criteria should be changed in such a way as to favor students who would likely choose career fields in demand and for whom residency positions were available. That option was consequently rejected, but two recommendations were formulated with respect to the premedical and medical advisory system. First, the committee recommended an enhancement of communications with the premedical advisory groups in the area in an attempt to clarify some of the mixed messages students are receiving regarding the expectations of admissions committees. Second, the committee recommended the provision of an intensive, ongoing medical student advisory program that would assist students in their professional role development. At the present, George Washington has such a program, but it affects only about a third of the student body; faculty feel that it is important that this be an ongoing program for all students.

Another issue discussed by the committee was the inevitable trend away from the cottage industry of medical practice to a highly competitive, corporate practice of medicine. This is, in the opinion of faculty, the predominant model

---

This summary was drawn from testimony presented by Dr. John Ott at the AAMC Northeastern Regional Hearings held May 5-6, 1983.

that will develop in many large cities. Faculty feel that they are not currently or adequately preparing students to cope with the rapidly changing environment. They feel students need to enhance their personal management skills, as well as their practical management skills, and their awareness of the environment around them, if they are to compete successfully in this rapidly changing setting.

In the view of faculty, the physician of tomorrow will clearly have to be able to manipulate and assimilate data via the computer. A previous attempt to institute computer-based instruction in the form of patient management problems was singularly unsuccessful. In retrospect, faculty believe the students were so threatened by the hardware and their computer illiteracy that they had great difficulty in overcoming these problems. In a decade, entering students will be computer-literate; this probably will not be true of the faculty--something that poses a long-range problem. Many faculty members have used the computer indirectly in carrying out research activities, but relatively few are competent in the actual operation of the computer and the ability to manipulate the equipment to get the best information from it. As a result, faculty serve as relatively poor role models for students in this respect. The chairman of the Department of Computer Medicine has proposed the use of video games as a means of introducing computers to students who have no experience with them. Access to microcomputers and technical assistance has also been proposed. A required course in the use of computers and the teaching of clinical decision-making via the computer were rejected.

Future changes in the curriculum may include revisions in the areas of professionaliam, occupational medicine, patient education, and others; the current thinking is that these matters might best be taught through an interdisciplinary, interdepartmental effort.

A problem facing faculty is the need to overcome the increasing dependence on patient-care dollars to support patient care activities. Serious efforts need to be devoted to working out alternatives in caring for an increased number of patients without adversely affecting academic activities.

MEDICAL COLLEGE OF GEORGIA

For Additional
Information, Contact: Boyd D. Sisson, Ph.D.
Associate Dean for Admissions
1120 Fifteenth Street Room 169
Augusta, GA 30912
(404) 828-4792

The Medical College of Georgia chose to address issues and problems in medical education under the headings of essential knowledge, fundamental skills, and personal qualities, values, and attitudes.

Essential Knowledge. Under the rubric of essential knowledge, the Medical College of Georgia offered the following comments and suggestions:

1. Teachers need to stimulate changes in learning styles--for instance, by enhancing opportunities for independent learning.

2. In determining the essential knowledge physicians need, input from college and medical school teachers, private physicians, and appropriate laymen should be solicited. Furthermore, the physician's functions in an office setting, the hospital, and the community at large and studies of practice patterns should be considered.

3. The content of the principles fundamental to medical science should be the basis for any determination of essential knowledge.

4. Student will have to learn the same quantity of essential knowledge--memorize it, that is--as long as they have to take the National Boards. The Boards should test more for the use of concepts. Students feel that faculty instruction is driven by the Boards.

5. The current sequence in medical education in which the basic sciences precede the clinical sciences is not necessarily the best order. An intermixing of basic and clinical science as the students progress through the curriculum may be best for stimulating students' interest. Conjoint presentations by basic and clinical scientists in a "grand round" setting could be instituted and clinically oriented questions could be included on examinations in the basic sciences.

6. Steps should be taken to meet students' deficiencies in diagnosing and treating subtle illness. They often do not see, for instance, psychiatric disorders that are accompanied by mild somatic complaints; they lack experience in the management of the severely ill, but not hospitalized, patient (for instance, those with chronic cardiovascular disease). They also do not acquire experience in the everyday business of running a medical practice.

Fundamental Skills. With respect to the fundamental skills aspiring physicians need to develop, the Medical College of Georgia offered the following comments and suggestions:

1. During college preparation for medicine, skills in reading, quantitative analytic reasoning, and problem-solving can be developed by a variety of courses, e.g., logic, physics, creative writing, etc. Instruction that promotes deductive thinking is more important than the course title. Above all, improving reading and writing skills should receive priority.

2. The MCAT is helpful to Admissions Committees, but it does not measure problem-solving skills. A new Reading Skills Section to evaluate scientific reading and comprehension is suggested.

3. Passive learning experiences, such as lectures and multiple-choice testing, hamper the development of independent learning skills and encourage learning for the short term. While in medical school, students should have the opportunity to identify the learning modality, e.g., audiovisual, seminars, journals, etc., that will best promote continuing education for them as independent learners.

4. Prior to entering medical school, students need to acquire some familiarity with computer technology. A college course on computers for personal use could provide the needed background. The use of computers in medical education is limited; the potential for their use is unlimited. The value of computers in independent learning, computer-based decision making, patient-data retrieval, and office management is recognized. However, financial constraints require that each medical faculty establish priorities in this area and utilize the available resources.

5. The determination of those skills that are fundamental to the physician is often made on the departmental level with minimal discussion and coordination by Faculty Curriculum Committees. Three factors may interfere with coordinated decision making on fundamental skills: (1) recruitment by departments for their own specialties; (2) the power-base of the medical school; and (3) money--i.e., the department that generates revenue receives more time in the curriculum.

Discussions of the personal qualities, values, and attitudes that physicians should develop and display yielded the following comments and suggestions:

1. Faculty and students can promote positive aspects of competition and hard work, simply by serving as role models, demonstrating the system is not unfair--anymore than life is unfair.

2. When students lie and cheat and are allowed to do this, they cause harm to their fellow students, to the system, and to their future patients. Integrity must be maintained at all times.

3. Assuming physician-patient rapport is in order and demands made on the physician are reasonable ones, physicians should be ready to make sacrifices when the welfare of the patient is in question, and should be available or have someone be there in his place when he is unavailable. Students should be taught and reminded of this priority throughout their professional education, but teaching should not be such as to induce a feeling of guilt in the student. Furthermore, whenever appropriate, courses

should include patient welfare content, which may be emphasized in such areas as physical diagnosis, behavioral science, and clinical medicine. Good role models are needed, such as the clinician who includes personal aspects of his patient when presenting cases to students.

4. An exercise entitled "Physical and Emotional Rounds" should be established, especially for those faculty who become so engrossed in the physical process of disease that the emotional aspects of the patient are neglected. Even though the physician has compassion for his patients, it may be necessary to make a point to show his concern in order to reinforce the concept of patient welfare. He should be ready to deal with the patient's social background or have someone available who can deal with it (e.g., a social worker). The physician should guide the student to think of the patient's welfare before ordering a test, drawing blood, taking an x-ray, etc. Instead of feeling offended when a student questions his judgment, the physician should welcome the challenge.

5. Experiences that promote student stress are: (a) over-testing, which could be eased by an interdepartmental coordination committee; (b) unclear testing objectives, which might be lessened by departments explaining their philosophy of testing; (c) interdepartmental politics; (d) letter grading system, suggesting study of feasibility of Pass/Fail or some other system; (e) role of National Board examinations; and (f) variation in sensitivity of faculty. Additional ways faculties might reduce or eliminate unnecessary stress are provision of tutorial programs, reduction of lecture time and more emphasis on individual study, stress management workshops at appropriate times, and peer support groups. Better ways for early detection of students with impaired coping mechanisms should be sought, and psychiatric assistance should be readily available to students so identified or who seek it.

UNIVERSITY OF HAWAII SCHOOL OF MEDICINE

For Additional
Information, Contact: Terence A. Rogers, Ph.D.
Dean
1960 East-West Road
Honolulu, HI 96822
(808) 948-8287

The University of Hawaii has two main concerns about medical education:

The curriculum is too full. Beginning with premedical training, teachers of technical subjects are concerned with transmitting a "body of knowledge" in their discipline, and this knowledge is not directed at the professional education of physicians, and so its relevance is often quite random. The pressure to "cover all the material" in part accounts for the maniacal detail in which basic sciences are taught--a level of detail completely incongruent with realistic expectations of the students' retention but congruent with NBME Part I scores of 500-600.

Careful reappraisal of the basic sciences (in concert with the NBME) with particular attention to its role in preparing students for the practice of medicine is needed. Hawaii has considered diminishing the pressure of the basic science curriculum by an increase in the scope of science prerequisites for admission to medical school, not entirely add-ons. It was noted that medical faculties have not usually taken much responsibility for premedical training--either directly or by collegial negotiation with faculty teaching undergraduates.

The clinical clerkship rotations in the third and fourth years are generally satisfactory. Nationwide problems here are inaccessibility of full-time faculty, and, while residents provide excellent teaching, they are too busy and inexperienced to provide a continuing, in-depth evaluation of students. The fourth-year "elective" opportunities can result in a leisurely amble through academic medicine. Hawaii raises the question, should all four years be utilized in the overfull medical curriculum to relieve some of the pressure in the basic science years?

Too many doctors do not see their patients as human beings. This perception by some is valid. The faculty must take their responsibility as role models in the humanistic context just as seriously as they do in clinical acumen and technical brilliance. Also, the reward system for faculty must recognize this crucial element of faculty performance. Faculty evaluations of students' attitudes should include attitudes toward patients, as well as attitudes toward authority. A pervasive perception about doctors' lack of concern with their patients springs from the observation that patients are seldom accorded a real role in decision-making about alternative strategies for managing their illnesses. Insistence on recognizing the dignity and worth of the individual can greatly strengthen the doctrine of informed consent and must be taught by example of the faculty.

HOWARD UNIVERSITY COLLEGE OF MEDICINE

For Additional
Information, Contact: Pauline Y. Titus-Dillon, M.D.
Associate Dean for Academic Affairs
520 W Street, N.W.
Washington, D.C. 20059
(202) 636-6270

As a participant in the project, Howard University College of Medicine made the following comments and recommendations regarding essential knowledge, fundamental skills, and personal qualities, values, and attitudes.

Essential Knowledge. Methods of establishing essential knowledge might include outlining basic concepts to be mastered in each discipline; assessing the relationship between concepts learned in college and those to be mastered in medical school; emphasizing the continuity of education from college through medical school and graduate medical education; and designing evaluation tools to monitor the accomplishment of learning objectives.

In the course of their premedical education, students should obtain a strong foundation in literature, the humanities, and social sciences. They should master the principles of general chemistry and physics and acquire knowledge and academic discipline not only through completion of science courses, but also through courses like philosophy and logic. Furthermore, the MCAT should be revised to evaluate essential knowledge more effectively. During medical school, students should acquire basic science knowledge first, then use it to learn and apply the clinical sciences in the practice of medicine. More emphasis should be placed on ambulatory care and more instruction given in geriatrics and nutrition. Finally, more dialogue should take place among faculties, licensing boards, and others about the medical curriculum and medical-practice authorization.

Fundamental Skills. Skills in reading, writing, oral communication, learning, time-management, and test taking should be acquired before completion of the premedical curriculum. More emphasis should be placed on learning the skills of quantitative and analytic reasoning, critical inquiry, and ability to integrate information.

Both before and during medical school, the acquisition of skills in independent learning should be an immediate and long-term goal of the student. The clinical skills of history-taking and performing good physical examinations should be mastered before graduation.

Personal Qualities, Values, and Attitudes. Students aspiring to enter the medical profession should show strong motivation and a scholarly inquiring attitude. During their college years, students should be exposed to persons who demonstrate the dedication, discipline, and industry necessary for good medical practice.

All medical students should have qualities of honesty, compassion, self-discipline, curiosity, and sound judgment. Teaching by role models should occur throughout medical school. Functioning student advisory systems should be present in medical schools throughout the entire period of professional education. Finally, administrators in medical schools and teaching hospitals should demonstrate, by example, a concerned attitude toward all within their institutions.

INDIANA UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: James E. Carter, M.D.
Associate Dean for Student and Curricular Affairs
635 Barnhill Drive, Room 164
Indianapolis, IN 46223
(317) 264-7175

Recurrent themes or issues Indiana identified for further action were in the areas of teaching, curriculum, communication, and evaluation.

Teaching. The faculty had three significant concerns. One is the analysis and development of effective pedagogic techniques and alternative approaches. The faculty realized a need for developing the use of a variety of teaching techniques, i.e., self-instruction, small discussion groups, in order to effectively use curricular time and to provide instruction in the increasing number of related medical issues. Also faculty reaffirmed its commitment to assist students in coping with the amount of material presented. Faculty noted the need to review current support programs and to consider further development and utilization of such programs. The second concern was meaningful recognition of excellence in teaching to include the documentation of good teaching. To encourage faculty to evaluate and improve their presentations, the faculty realized a need to recognize and reward such activities. Thirdly, faculty noted a need to assist the housestaff in developing effective teaching skills due to their extensive involvement in the clinical educational programs.

Curriculum. Two issues were raised by faculty. In light of the growing number of medical topics and pressure for their inclusion in the curriculum, the faculty noted the need for identification of the fundamental skills, knowledge, and attitudes which students should acquire in undergraduate medical education. Secondly, the faculty noted the need to permit increasing curricular flexibility to meet individual students' needs, as well as the needs of the growing field of medical knowledge.

Communication. The faculty addressed a specific institutional issue to increase the level of communication among the different units in the statewide system, i.e., centers, departments, and faculty committees.

Evaluation. The faculty identified the need to evaluate the current grading system at Indiana as to its appropriateness and measurement of students' skills and knowledge.

To deal with these issues four faculty work groups were appointed. These groups will initiate new programs or redirect current ones in: (1) grading; (2) housestaff development of teaching skills; (3) "new faculty" orientation; and (4) the role of computers in instruction. A fifth work group was assigned to address issues as a standing Goals and Planning Committee. This committee is considering different avenues for rewarding excellence in teaching, revisions of the curriculum to permit more flexibility, the identification of skills, knowledge, and attitudes that each physician needs, and the development of new opportunities for independent learning.

UNIVERSITY OF IOWA COLLEGE OF MEDICINE

For Additional
Information, Contact: George L. Baker, M.D.
Associate Dean for Student Affairs and Curriculum
101D - CMAB
Iowa City, IA 52242
(319) 353-7353

The University of Iowa College of Medicine, the only medical school in the state, is state-supported. Faculty and students believe that its standards for knowledge, skills, and behavior are high.

Several programs and policies in the school reflect a conscious regard for students' needs and personal development.

1. All individuals admitted have an option to defer for any reason, and the leave policy is liberal.

2. Human Dimensions in Medicine, a freshman required course, focuses on the student as a person and on his or her experiences upon entering medicine.

3. The third-year schedule is arranged to alternate demanding clerkships with less demanding ones.

4. Small group experiences are emphasized throughout.

5. A staff of professionals is available to assist students with career, financial, academic, and personal planning and other needs.

Iowa students, faculty, and staff involved in this project have worked in three areas: the college admissions committee, the curriculum committee, and a special workshop dealing with the clinical curriculum.

The admissions committee formed three groups that corresponded to the AAMC working groups. Each group met two or three times, and the entire committee subsequently reviewed their preliminary report. Their proposals will be refined before they submit a report to the faculty for implementation. Their preliminary thinking on the area of essential knowledge is that:

1. The physician must have a solid base of essential knowledge in order to access information from any source--print or computer.

2. Independent learning should be encouraged by paying more attention to undergraduate courses that require active intellectual participation, such as logic, creative writing, and independent study projects. Application forms of both the school and AMCAS should be revised to focus on such areas.

In medical school, although basic science directors find that the laboratory can foster independent learning, most believe students are so inundated with the course load that it is inappropriate to require extensive independent learning assignments.

This summary was drawn from testimony presented by Dr. George Baker at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

3. Physicians should be able to write clearly. As a part of the MCAT, proctored written work, not scored by MCAT, could be sent to admissions committees for their use.

4. Applicants may be encouraged to obtain work experiences in a health care area.

Their preliminary thinking in the area of fundamental skills is that admissions materials should encourage applicants to participate in activities that promote and enhance sound decision-making skills and independent learning skills.

With regard to the area of personal qualities, Dr. Woodrow Morris of Iowa has been developing a noncognitive test that selects for qualities sought in physicians. This work was reviewed and thought to show promise.

Personal qualities, values, and attitudes are considered in one course in which team cooperation is required and graded and in one in which personal qualities, values, and attitudes are explored in small group experiences.

The clinical portion of the curriculum was considered in a workshop of 15 senior faculty, clerkship directors, and department heads and 15 students finishing either year three or four. Student and faculty observations included the following: the need for greater reinforcement of basic skills; greater attention to history and physical skills with less reliance on laboratory; more time for faculty and students to be together formally and informally; and the need for adequate role models.

Students expressed a high regard for the ability of the faculty but found the initial clinical experience to be emotionally trying. Initially, playing the role of a physician presents an ethical dilemma, assuming more experience than the student has really had and presenting at times less than an honest picture to patients. Evaluations could be much more helpful. In the clinical area, students want formative evaluations. Current, specific feedback is very valuable. Students find clerkships, where expectations are specified, to be better learning experiences. They want to please, but they need to know the game plan. Students asked for supervision in a system that forces responsibility on them for their own learning.

Future plans include a follow-up report to the participants from this workshop with a notation of changes that could easily be made and implemented; positive reinforcement of things that were documented as well done at the present time; and a long-range plan for more difficult proposals with a report to the full faculty at the end of the academic year.

JEFFERSON MEDICAL COLLEGE

For Additional
Information, Contact: Joseph S. Gonnella, M.D.
Acting Dean
1025 Walnut Street
Philadelphia, PA 19107
(215) 928-6982

The following is derived from the report submitted by the Jefferson faculty:

1. It is estimated that about 20 percent of Jefferson's students have had one or more courses dealing with computers. In the future they expect its application to be widespread in teaching, evaluation, etc.

2. Jefferson feels their best approach is to know as much about undergraduate colleges from which candidates apply to better assess the performance and background of one applicant versus another.

3. They agree in principle that students entering medical school should have broad baccalaureate educations; they caution that all students ought not necessarily to follow similar pathways. They feel that medicine benefits from having students enter it from diverse backgrounds and educational experiences.

4. A student who for admission to medical school takes inorganic and organic chemistry, introductory physics, and introductory biology will have been provided with the opportunity to develop skills in reading, quantitative analytic reasoning, and problem solving.

Jefferson faculty feel that the Reading and Quantitative sections of the MCAT do give a measure of an individual's ability "to comprehend, evaluate, and use information in a narrative or a quantitative format," and the Science Problems section does test ability to make judgments and draw conclusions. Correlation studies indicate that the Science Problems section performance is one of the better predictors of performance at Jefferson Medical College in the first two years.

5. In admissions Jefferson faculty look not only at the quality and scope of undergraduate course work of applicants, but also to the variety of their interests and their backgrounds. Extracurricular activities are important to develop broader interests, leadership qualities, social maturity and communication skills, and to provide a change of pace. These activities are encouraged but not to the detriment of performance in academic courses.

6. Faculties in college should stimulate their students' curiosity and promote their intellectual drive and imagination and promote skepticism and openness to new ideas. Faculties need to set examples and free and open communication needs to be encouraged. There should be discouragement of the "premed syndrome," particularly that aspect that tends to make students select only those courses in which they feel secure in obtaining high grades.

JEFFERSON PAGE TWO

7. Attitudes can be learned and enhanced by example. Communication on a broad base involving both students and faculty can achieve many results: different points of view can be aired, misunderstandings can be avoided and rectified, and the reasons for supporting an environment that discourages lying and cheating can be explored. Competition is not necessarily negative, nor is devotion to hard work, and these are areas that can be thoroughly discussed.

JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE AND SCHOOL OF ARTS AND SCIENCES

For Additional
Information, Contact: John H. Yardley, M.D.
Associate Dean for Academic Affairs
720 Rutland Avenue--118 MAB
Baltimore, MD 21205
(301) 955-8401

Richard P. Longaker, Ph.D.
Provost and Vice President for Academic Affairs
Garland Hall Room 265
34th and Charles Streets
Baltimore, MD 21218
(301) 338-8070

Hopkins views the problems associated with premedical education as not primarily curricular but rather in the perceptions and expectations of premedical students. For them, college is not a place to sharpen critical skills, investigate options, and experience intellectual stimulation and growth. It is a mine field to keep them from achieving their goal of entering medical school.

If medical schools wish to encourage greater breadth and diversity among applicants, they should deemphasize early admissions programs that eliminate or devalue the bachelor's degree. Medical schools should also convey to secondary schools the importance of breadth in education. This could be done through nationally distributed pamphlets for high school students interested in medical careers or through symposia for counselors and teachers' organizations.

An increased emphasis on the bachelor's degree as a prerequisite for admissions and a concerted educational campaign by medical schools would be the first significant steps toward changing the way premeds are educated.

AAMC, Hopkins charges, has contributed to the sterility of pressured, preprofessional education. Its centralized application service, they assert, reinforces the idea of only one route and a single form of standardized credentials by which students can gain access to medical school. Furthermore, they add, AMCAS has encouraged computerized, numerical assessments of students that emphasize grade point averages and MCAT scores. AAMC is also faulted for its inability to police and enforce published recommendations concerning acceptance procedures of medical schools. Validity of the MCAT in selecting medical students was questioned because "there are no data demonstrating that MCAT scores correlate with performance in the clinical sciences or with future sucess in medical careers." AAMC should reappraise the relative merits of the MCAT, Hopkins concludes.

To increase the range of preparations and pathways for entry to medical school and to encourage broadening of educational and other experiences, Hopkins is modifying its longstanding programs of early (chiefly sophomore) admissions into a new program termed Flexible Medical School Admissions (FlexMed). The major features of the program are: (1) college seniors, after acceptance in the regular way, may apply for a 1-2 year delay in matriculation; (2) college juniors may apply to Hopkins and if accepted be considered for one of several options, including continuation in their own colleges through the senior year, transfer to Johns Hopkins or another college for additional undergraduate education, or, if eligible to receive the Bachelor's Degree, they may begin medical school immediately. An important feature of FlexMed is that these options must be approved by a special committee in the School of Medicine. Thereafter, the student is treated (even in absentia) as a Johns Hopkins student for individual program planning and advising.

The goals in the preclinical curriculum are to maintain quality teaching of all subjects, including the sciences, but in ways that will help reduce tightly packed ("congested") course scheduling. While a large amount of factual and conceptual knowledge is essential to medical education, ways will be sought to improve the balance between what is defined for students to learn and what they decide on their own to learn.

An examination of all required clinical clerkships is nearing completion at Hopkins.

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE

For Additional
Information, Contact: John Clancy, Jr., Ph.D.
Associate Dean for Student Affairs
39th and Rainbow Boulevard, Room 107A
Kansas City, KS 66103
(913) 588-5283

The University of Kansas report described four ongoing programs and projects relevant to some of the assumptions in the "Charges" booklet.

Grading System Change

In July 1979 the University of Kansas School of Medicine made the decision to change from a pass/fail system to a five-point grading system. This new system allowed them to provide institutions reviewing intern applicants with an excellent appraisal of the student's academic achievement during medical school, which, in turn, provides a better understanding of the student's potential as a resident.

Gerontology/Geriatrics in Medical School Curriculum

During the past five years a steady effort by concerned faculty has led to enrichment of the medical school curriculum in gerontology and geriatrics by adaptation of some required courses and addition of a few elective courses. The tempo of this effort will be increased during the remainder of 1983 as a result of a detailed evaluation of the entire four-year medical school curriculum conducted by a committee of two clinicians and two educational psychologists. This effort is sponsored by the University of Kansas Long-Term Care Gerontology Center and the Dean of the the School of Medicine, with endorsement by the Curriculum Committee of the Medical Faculty. A careful inventory of both gerontology and geriatric present content as well as gerontology and geriatric content need will be conducted for both required and elective courses. When the study is complete a report will be rendered to each basic science and clinical department through its chairman to direct curriculum content changes in respect to gerontology and geriatrics. This effort will serve the general strategy of infiltrating required courses and creating new elective courses.

Preceptorship Program

Since 1951, the preceptorship program has been a required clinical rotation during which each student works with a practicing physician (preceptor) in the State of Kansas. It is eight weeks for students following the four-year curriculum. There may be minor differences for students participating in the University of Kansas School of Medicine at Wichita, but most of the requirements and the primary objectives are the same: (1) to provide students with a meaningful educational experience utilizing a one-to-one teaching/learning relationship in private practice (i.e., noninstitutional) setting; (2) to promote better communication between the preceptor and the medical school by involving the preceptor as an integral part of the student education process; and (3) to expose students to both professional and nonprofessional aspects of the preceptor's family and social life in a community environment.

CAI Programs in Teaching Pharmacology and Anatomy

The Pharmacology Department at the University of Kansas School of Medicine has had extensive experience with a computer-assisted instruction (CAI) system in teaching pharmacology to medical students and other health professionals. The system is composed of both computer-assisted instruction and computer-managed instruction. The "Keller Plan" philosophy has been adopted, and the pharmacology course is organized into modules. Students are required to meet minimum proficiency requirements in each module and have multiple chances to reach this or higher levels. The advantages of this system are numerous. The department can provide both scheduled and independent study courses in basic pharmacology to students of different educational levels. Students can progress through a course at various speeds; that is, achievement is constant, but time is variable. Both the student and instructors are provided with frequent and rapid feedback. Most importantly, students with low aptitudes seem to achieve significantly higher scores on the pharmacology section of the examination of the National Board of Medical Examiners.

The increasing use of advanced technology in diagnostic radiology has put increased emphasis on teaching human anatomy. To improve the students' ability to correlate structures learned on the cadaver with those seen on x-ray, an entirely computer-controlled course in Radiological Anatomy is given the first semester of medical school. Last year (1982-83) one thousand eight hundred (1800) twenty-five question exams were given to two hundred (200) medical students with two hundred and twenty-five (225) anatomical structures presented for identification on plane x-rays, arteriograms, CAT scans, ventriculograms and mammography films. Through such use of computers faculty teaching is greatly extended. Similarly for the past two years the Department of Anatomy has generated all written exams from a three thousand five hundred (3500) question bank stored on the hard disc of a microprocessor. All exams were graded within the department on the same equipment, which permits return of student grades and exam review in two to three hours. Rapid turnaround of exam results and immediate exam review reinforces learning. The Department of Anatomy sees increasing need of computer assistance in increasing teaching efficiency. They are looking at the feasibility of linking a video disc with a microprocessor that will add detailed graphic capability to the fifty computer-assisted instruction courses offered in Neuroanatomy and Gross Anatomy.

UNIVERSITY OF KENTUCKY COLLEGE OF MEDICINE

For Additional
Information, Contact: Terrence M. Leigh, Ed.D.
Assistant Dean for Academic Affairs
Room MN-108A Chandler Medical Center
Lexington, KY 40536
(606) 233-6660

Four major concerns cited here are: (1) the tendency of baccalaureate and medical education programs to promote passive learning; (2) the current relevance of science prerequisites for medical school and the need for courses in the humanities/liberal arts; (3) The cost-effectiveness dilemma between increased student/faculty interaction and a progressively tighter budget; and (4) the development of a continuum of experiences throughout medical school that emphasizes patient welfare and the positive aspects of physician behavior.

Several educational modifications have been initiated to redress these problems:

Curriculum Overview Committee. A Curriculum Overview Committee was appointed to supervise and manage the curriculum. It is directed to: (1) ensure that topics relevant to national health problems are included in the total curriculum; (2) determine that the student learning environment includes a variety of educational methodologies with emphasis on problem solving; (3) conduct periodic evaluations of content emphasis and recommend changes to the specific curriculum committees for implementation; and (4) periodically examine the general undergraduate preparation of entering students and recommend, when necessary, changes in the requirements for admission.

Decompression of Year One. It was agreed that the material presented in the first year was excessive for the time available. To provide time to facilitate comprehension and understanding rather than rote memorization of facts, the college lengthened its first year by four weeks. Concurrent with the calendar change were changes in the schedule of contact hours with no classes on weekends and one week-day afternoon free of scheduled time.

Rewards for Teaching Excellence. In addition to the first year decompression, a concerted effort is being made to emphasize problem-solving learning and to encourage faculty efforts toward modification of teaching methodology. The Division of Educational Development, a unit responsible for faculty development, has budgetary support for planning and designing new teaching strategies. Moreover, the dean of the college has encouraged faculty to reduce the number of lecture hours; a goal of ten percent per year in each of the next five years has been recommended with a corresponding increase in innovative teaching activities. To ensure adequate opportunity for faculty to develop innovative teaching approaches, the dean has offered to subsidize faculty who are given release-time from responsibilities by their departmental chairperson.

Alternatives to the Lock-Step Curriculum. For the fall of 1982 an independent study program for the entire first year of medical study was offered to interested students as an alternative to the traditional curriculum. Faculty in each department, recognized for their teaching competence and interest in student learning, were designated as preceptors for this program. Students are expected to follow reading assignments and problem-solving exercises with routine discussion periods with faculty and other students.

Also beginning in 1982, additional course options were made avaiable for students electing to remain in the traditional first-year curriculum. These options were alternatives to the customary biochemistry and medical microbiology courses, and were available to any student who had previous study in these subject areas. Like the courses in the independent study program, these options utilize a tutorial/Socratic approach to learning.

Research Fellowship Year. For 1983 a research fellowship year became available for four students who wish to pursue individual research interests under the guidance and with the support of selected faculty recognized for their research expertise. Fiscal support shall be provided by stipends from the Dean's office, and grant and departmental funds.

Increased Communication with Undergraduate Advisers. Attention is also being given to this area, including a biennial conference with undergraduate advisers from the state of Kentucky, hosted alternatively with the University of Louisville, and the college is studying the possibility of additional workshops and the preparation of a syllabus as guides to the preparation of students for admission to the college.

LOUISIANA STATE UNIVERSITY, NEW ORLEANS, SCHOOL OF MEDICINE

For Additional
Information, Contact: Howard M. Randall, Ph.D.
Associate Dean for Faculty Affairs
1542 Tulane Avenue
New Orleans, LA 70112
(504) 568-4875

As part of a major curriculum revision at the LSU School of Medicine, a new senior course was implemented in 1981-82. The Curriculum Committee concluded that LSU students were not receiving sufficient instruction in geriatrics, nutrition, human sexuality, and alcohol and drug abuse. Some instruction in these subjects was being presented in a variety of basic science and clinical science courses, but presentations were fragmented and brief. The committee also wanted to provide some instruction in the area of office management and financial planning. As a first step in the developmental process, the committee decided to form a required four-week block in the senior year entitled "Special Topics." The curriculum committee appointed an ad hoc committee composed of its chairman and directors for each topic to develop this new block. Each director was given the responsibility of developing his particular topic. Consultations with other members of the faculty took place during this process. The four weeks were divided in such a manner that nutrition and human sexuality had the majority of the time, a little bit more time than geriatrics and alcohol and drug abuse. The final topic, office management and financial planning, received the least amount of time. Because of the time constraints of teaching five topics in four weeks, the lecture format was selected as the primary instructional method.

Many guest lecturers, experts in their fields, participated in the course. Clinical nutrition was scheduled three days a week over a two-week period. The general format of the course was lecture to convey information, followed by laboratory sessions to apply that information; 15 lectures were given during the morning hours, and five two-hour laboratory sessions, which were supervised by area hospital dietitians, were given in the afternoons. During the laboratories, selected case histories, illustrating disease states, were discussed in the context of the nutritional assessment of patients. For example, in one case history, students had to develop a daily menu for a diabetic patient for a period of one week. The course objectives in clinical nutrition were: (1) to recognize patients with nutritional problems; and (2) to develop an ability to plan, initiate, and implement corrective measures in patients with nutritional disorders. At the completion of the course, the students were expected to be able to assess the nutritional status of the patients, the nutrient requirements of infants to adults in both health and disease, the management of depleted patients, the management of obese patients, and the management of a variety of disease states. In addition, students received instruction in the role of nutrition in preventive medicine, concerning coronary heart disease, alcoholism, cancer, and hypertension.

This summary was drawn from testimony presented by Dr. Howard M. Randall and Dr. Janine Edwards at the AAMC Southern Regional Hearings held February 24-25, 1983.

Before the overall scheduling of special topics was finalized, representatives of the senior class were asked to provide informal criticism of the schedule. As a result, lectures were concentrated in the morning hours and reduced from 50 to 45 minutes. By concentrating lectures in the morning, classes could end by midafternoon. The representative students were of the opinion that such a schedule would be reasonably well attended, particularly if the sessions were well presented with new and significant information. Their opinion proved to be very accurate. Additional suggestions from the students resulted in a placement of the special topics to the last block of the senior year.

The evaluation of the first year's special topics course included evaluation of student achievement and formative evaluation of the course. At the conclusion of the course, the alcohol and drug abuse course director arranged to hold a dinner for the speakers and the class leaders to evaluate that specific topic. In general, the students recommended that the special topics course do three things: (1) present new information; (2) have well organized and interesting presentations containing significant information; and (3) present pearls of wisdom and practical tips based on clinical experience. Shortly after the course concluded, the administrators met with the topic directors to evaluate the course. At this meeting each topic director evaluated his portion of the course and proposed changes for the succeeding year. The results of both the faculty and student evaluation can be summarized as follows:

Nutrition was considered the best topic by virtue of its content and the instructional methods. Office management was a popular topic that contributed new and interesting information to the four-year curriculum. The alcohol and drug abuse topic was judged to be of fair quality; new information had been given and the students were more receptive to it than anyone had anticipated. The geriatrics course, on the other hand, gave little new information, although it did serve as a review of some previously fragmented knowledge and experience students had acquired during the four years. The human sexuality course was unpopular. The students had been exposed to that topic during their sophomore year and many had viewed it at that time as a negative experience. Attendance in the senior special topics course for human sexuality was poor, and the student response on the written questionnaire was negative.

Planning for the 1983 special topics course reflected these findings. Nutrition is being continued; office management is being expanded to include new material; geriatrics and alcohol and drug abuse are using less time; introduction to computers is being offered; and human sexuality has been suspended for two years, pending further development.

LOUISIANA STATE UNIVERSITY, SHREVEPORT, SCHOOL OF MEDICINE

For Additional
Information, Contact: Perry G. Rigby, M.D.
Dean
Post Office Box 33932
Shreveport, LA 71130
(318) 674-5240

The LSU/Shreveport Curriculum Committee conjointly with the general faculty agreed to adjust the curriculum over the next 18 months. A working hypothesis for curriculum reform--the paradigmatic approach--was formulated. The basic assumption is that knowledge is paradigmatic. It represents the creative assembly of selected experiences into a model rather than the mere accrual of facts. It follows that learning is the recreation of that act and that creation and assimilation of knowledge are reflections of a common mental process. In contrast, traditional medical school curricula place the emphasis on memorization of accumulated detail leading to a generalization. This approach is not only inefficient and getting more so given the rapid proliferation of data under an established paradigm but is fundamentally inconsistent with the process that brought knowledge into existence in the first place. Furthermore, the paradigmatic approach clarifies for the student the bewildering and often cataclysmic shifts in "viewpoints"--in reality paradigm shifts--occurring as a consequence of technological advances and subsequent creative assembly of facts into new paradigms.

Ordered knowledge, the paradigm, should be presented early in the medical student's experience. Since paradigms are in reality supported by only a few critical facts and the vast majority of detail has been subsequently generated, the deletion of this "after the fact" material would greatly streamline the subject matter. In-depth presentation of the cornerstone experiments, as opposed to rapid coverage of post-paradigm generated data, would serve to sharpen the students' critical acumen. The creation of the paradigm from these few facts should be given in a straight-forward, unambiguous fashion. This approach to the basic science curriculum is consistent with the stated assumption that knowledge and knowing are paradigmatic in nature and that solid grounding in the experimental basis is all important for the clinical use of that paradigm.

Learning skills that implement the paradigmatic approach are of two types: (1) creative-independent; and (2) recreative guided experiences. The goal of the former, creative-independent, is a practical understanding of the paradigmatic nature of knowledge and its creation from assembly of selected experiences. Three LSU programs are designed to accomplish this: medical students' honors research, summer research, and electives. Students gain entrance to these programs with well defined projects explicitly within or challenging the paradigm existing in the faculty adviser's specialty. The results of their efforts are presented in a formal 10-minute presentation at the local annual Student Research Forum to the faculty community (LSU's Forum, held in early April, is now in its fifth year). The proceedings of these forums are published in the Louisiana State Medical Journal. The student is then encouraged to present his/her work at the SAMA, ASCR, or FASEB meetings. From this the student gains working insight into how knowledge is generated and presented, the creative process involved, and peer group response--all fundamental to the perpetuation of an academic environment.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE

For Additional
Information, Contact: Marjorie P. Wilson, M.D.
Senior Associate Dean
655 West Baltimore Street
Baltimore, MD 21201
(301) 528-7411

The University of Maryland noted six major institutional concerns:

1. Methods of examination during medical education must be reassessed and modified to reduce fact recall and improve teaching of analytical skills and evaluation of problem solving.

2. Teacher development must be a required component within a teaching faculty with effective and meaningful rewards and advancement for teaching competency.

3. Curriculum in medical education needs to be flexible to meet the changing societal needs with appropriate methods of regular evaluation to validate and support curricular changes.

4. The medical education process should contain fewer large-group lectures and more emphasis on small-group opportunities and elective learning. Informal contacts between faculty and students should be encouraged.

5. More emphasis should be placed on appropriate, relevant, and standardized teaching within ambulatory settings utilizing interdisciplinary teams and combinations of academic and practicing health professionals.

6. The realities of academic achievement standards for faculty deemphasize contributions to undergraduate medical student education. Faculty time devoted to developing newer educational strategies should be appropriately rewarded and supported, including adequate resources of equipment and money.

Maryland presently is planning the following curricular changes:

1. Reduction in class lecture contact time of 10-15% the first year and 10% in the second year with the use of the available time as a longitudinal independent-study morning/afternoon currently being planned as a mandatory experience for freshmen within subjects taught in the first year and an elective opportunity for students in the sophomore year aimed at research, clinical, or remediation experiences.

2. An equalization of time commitment to the third and fourth year is under consideration, with the goal of a "return to basic science" concept during the clinical years currently being discussed.

3. Despite curriculum revisions and modifications, there appears to be a need for more definitive institutional curriculum objectives and plans that augment the ability to coordinate the four-year curriculum. An attempt will be made to remedy this situation in the near future.

4. The University of Maryland School of Medicine has implemented a return to the grading system, using A through F in all subjects. This needs regular reassessment as to efficacy and validity.

5. A peer evaluation system used during past years has been reinstituted during the current year.

6. Several departments have undertaken faculty development courses ranging from intensive to introductory. Discussions are underway relative to a more expansive faculty development, both for incoming new faculty and faculty already teaching within the medical school environment.

7. Faculty have been authoring and students have been utilizing computer-assisted instruction in the Learning Resources Center for the past eight years. Approximately 10-15 Maryland medical school faculty-authored programs are completed every year; and during the 1981-82 academic year, 13,000 lessons were utilized by students, residents, and faculty.

8. National Boards are no longer used as gateposts for promotion or graduation but are required for curriculum evaluation, using the item analysis as process. Curriculum evaluation by a computer-graded, external examination needs reassessment and will be studied in the near future.

The rationale underlying each modification was given and impediments to planned changes were discussed.

UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL

For Additional
Information, Contact: Paula L. Stillman, M.D.
Associate Dean for Curriculum
55 Lake Avenue North
Worcester, MA 01605
(617) 856-4265

Partly due to the faculty discussion generated as a result of the AAMC project, new educational strategies are being explored at the University of Massachusetts Medical School. The faculty is critically evaluating how and what it teaches; how and by whom core contents should be decided; the relationship between assigned reading, student handouts, and lecture content; how faculty can improve test construction skills; and how psychomotor, clinical, and problem-solving skills can be enhanced.

College Preparation. The ideal medical school applicant should be well-rounded and socially mature with good interpersonal and communication skills. With too much emphasis on scientific training, the broad educational background is too often lacking.

Preclinical Years. It is essential that medical schools enhance and increase students' proficiency in developing reasoning and problem solving skills during the preclinical years. To keep pace with advancing knowledge in medical science, techniques must be developed and implemented that will facilitate lifelong learning. Several steps could be taken to develop student skills in analysis and criticism: increase the number of small group, problem-solving sessions and workshops that encourage student participation and emphasize student-centered learning; use faculty role models who demonstrate a step-by-step approach to the analysis of problems; teach an in-depth approach to a few prototypic systems rather than using an encyclopedic approach; provide a wide variety of resources and emphasize individualized learning to solve relevant problems; require that students read and critique scientific articles, answer specific research questions, and present and defend their answers to their peers; and give open book exams that emphasize the integration and synthesis of information.

Clinical Years. There is a need to bridge the gap between the basic sciences and the clinical years. Basic science faculties should have greater involvement in clinical education. This could be accomplished by including regular pertinent input from the bsic scientists into the clinical years. It was suggested that some basic science teaching be interspersed throughout medical education rather than simply preceding the clinical years. This would increase the clinical relevancy of basic science information, help students develop a scientific approach to clinical problem-solving, and reinforce the material taught during the first two years of medical school.

NBME Examinations. The faculty generally agrees that medical schools should not teach for the National Boards. Efforts should be made to teach those basic science skills and knowledge required to prepare medical students for competent clinical practice. It is up to the National Boards to devise examinations which conform to national standards of basic knowledge and test for this data base. The ability of the National Boards to evaluate students' knowledge of essential concepts (as opposed to the ability to store scientific information) is also the responsibility of the National Boards as reflected in the design of the examination.

Electronic Technologies. In general, entering medical students have little familiarity with computers or their applications, but as computers become more commonplace, the percentage of students with familiarity will markedly increase. Before faculties can prepare students to use electronic technologies effectively, the faculties must themselves become computer-literate, so that they can serve as role models. For the next five years, emphasis should be placed not on teaching students about the new technologies, but rather on teaching faculty about the field and about applications which will improve their effectiveness in teaching basic science and clinical skills.

Attitudes and Values. In helping students to develop health mechanisms to cope with emotional stress, the faculty can communicate to students that feeling a certain amount of tension is a normal and adaptive process in becoming a physician and help students learn the distinction between being inexperienced and being incompetent. Moreover, it is important for the faculty to help students to realize that there exists, throughout all of medical education, a vast difference between what is known versus what is humanly possible for any one person to be able to learn. Assisting students to be aware of the impossibility of attempting to learn all that is known can go far in reducing the emotional stress of dealing with the ambiguity of not knowing everything.

In addition, faculty can minimize unnecessary stress by scheduling examinations to allow sufficient time to study, by reviewing the curriculum to avoid unplanned repetition, and establishing class schedules so that a certain amount of study time is allowed during each week. A critical factor in this area is to establish a system whereby committees making decisions about the process and content of education have students as actively participating members.

Interacting with Other Professionals. Learning to interact with other health professionals in delivering patient care is a significant aspect of the medical student's education. Opportunities to enhance interdisciplinary learning with other health professionals include seminars utilizing case studies, and small group discussions emphasizing the team approach. Skills that need to be emphasized in these seminars include awareness that the physician can no longer function alone in providing quality health care to patients; understanding of the various technologies available; and an ability and willingness to communicate with other health care providers in a manner which will elicit the feelings and attitudes inherent in a team approach to the solution of the problems of the patient. Other approaches could include faculty role modeling, or incorporation of an externship in allied health departments into the first and second year curriculum.

MCMASTER UNIVERSITY FACULTY OF MEDICINE

For Additional
Information, Contact: Victor R. Neufeld, M.D.
Director, M.D. Program
1200 Main Street West
Hamilton, Ontario CANADA L8S 4J9
(416) 525-9140 x2141

Important assumptions made by McMaster regarding the general professional education of physicians in planning an innovative M.D. program between 1966 and 1969 were as follows:

1. Consideration of health care problems* should dominate student learning from the point of entry into a general professional training for physicians.

2. Students enter medical schools to study medicine and the relevance of science (in the broadest sense) to this study is best defined if the nature of health problems is understood first. It follows that students do not need to be taught basic medical sciences in discrete premedical courses.

3. Important, essential, or relevant material in the basic sciences can and should be learned in the course of studying objectives relevant to a sufficiently wide and appropriately chosen range of health care problems*.

4. Knowledge (content), skills, and personal qualities must get equal and appropriate emphasis in the objectives to be attained.

5. Evaluation methods and procedures are important determinants of objectives achieved. The evaluation procedures used should guarantee similar weighting for objectives in all areas.

6. Ranking of students should be avoided and the evaluation should emphasize formative rather than summative aspects.

7. The didactic lecture as a method for transferring knowledge, particularly at an introductory level, can and should largely be replaced by other means possessing greater flexibility in scheduling student time. This also allows greater opportunity for the attainment by students of individual learning objectives.

The role of faculty members as guides to learning (e.g., as tutors in the small group setting) is of greater value than their roles as instructors presenting knowledge that is readily available from standard texts.

The principles and concerns enunciated above dominated the planning of the M.D. program which admitted its first students in 1969. A synopsis of the current program follows.

---

* The term "health care problems" is used to indicate an educational commitment beyond curative medicine, dealing with health maintenance and occupational and sociological factors.

Format of Present Program

1. Carefully selected students are admitted from diverse backgrounds that have in common at least a three-year university program but not necessarily including premedical science courses.

2. Students enter a ten-week period in which they are introduced to the general principles of the educational system. They learn to function in tutorial settings with appropriate emphasis on group dynamics, what resources are available to them, and, in particular, the optimal use of the Health Sciences Library. They encounter a range of health problems concerned with biological, behavioral, and sociological issues. They encounter the organized health care delivery system within the city in which they are studying.

A second ten-week period follows, which serves largely to introduce the students to basic pathophysiological mechanisms. This is followed by four ten-week blocks of time devoted to integrated organ-system pathophysiology, after which the students enter a clerkship lasting 48 weeks, including electives, and with mandatory rotation through medicine, surgery, pediatrics, family medicine, psychiatry, and obstetrics and gynecology.

3. At the end of each ten-week period of the curriculum and at the end of each clerkship rotation, student performance is evaluated by the tutor, guided by objectives established for that period of study. At the end of electives, performance is evaluated by the elective supervisor.

4. The official transcript of student performance is prepared by the student adviser, who has been closely related to the student throughout the program.

5. Although one to two lectures may be given daily during the nonelective parts of the program preceding the clerkship, no formal lecture courses are given in any subject.

6. Workshops are arranged at regular intervals to permit faculty members to improve their skills as tutors.

New Directions

1. The general objectives of a restructured program for students starting in September 1983 have been clarified. The objectives have been grouped under the headings biological, behavioral, and population in a fashion that is permitting specific objectives to be defined in each of these areas for each unit of the program. Basic concepts within the three perspectives are being listed.

2. Faculty opinion has been canvassed to develop "priority" problems based upon various criteria including frequency, treatability, and educational value. Knowledge relevant to these problems may constitute "core" objectives. Unit planners will be expected to offer health care problems from the "priority" lists.

3. Much greater effort is being expended to ensure that self-assessment materials are available so that students can learn from these what the faculty considers to be appropriate objectives.

4. The phases and units have been restructured. The broad introduction (Phase I) and the phase emphasizing the response of tissues to adverse stimuli (Phase II) have disappeared. An initial 15-week "Unit I" includes introductory objectives but is designed to discourage superficiality in favor of clearly defined objectives requisite for Unit II. An integrative Unit V follows Units II, III, and IV, which are biased towards problems in particular organ systems. Unit V emphasizes growth, development, and aging and also serves as a bridge into the clerkship.

5. Recognizing that three years may be too short for some students, McMaster has introduced flexibility into the duration of the program. This permits students to alter the time taken to complete the M.D. degree either within the existing objectives of the program or including additional time spent to seek a particular emphasis before graduating.

6. Final plans for evaluation in the restructured program are incomplete.

MERCER UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Ralph E. Berggren, M.D.
Associate Dean for Educational Programs
1550 College Street
Macon, GA 31207
(912) 744-2534

The Mercer University School of Medicine was given provisional accreditation by the Liaison Committee on Medical Education in June 1982, and its charter class of 24 students is in its second year of the program. Mercer expects to produce physicians who can respond to the health and medical needs of communities and to continue to educate themselves throughout their medical careers. Students have self-learning abilities and previous knowledge that the system uses to stimulate problem-based learning of essential information and skills necessary for a physician competent in the comprehensive care of patients.

The curriculum follows the educational approach of problem-based learning in small group tutorials of six students each. Students are given responsibility for their own learning but need to be guided by tutors, resource people, and student advisers.

In the Mercer program, the student is assumed to be a responsible, motivated, and independent adult. The students are encouraged, with appropriate guidance, to define their own individual learning goals, select appropriate experiences to achieve these goals, and be responsible for assessing their own learning goals. They are encouraged to review their individual previous experiences in academic training, their future career plans, and their learning opportunities at Mercer. This view of their personal past, present, and future then forms a base for goal definition. Self-directed learning also involves the learning of methods of managing information; included are such basic abilities as efficient reading, using practical personal information retrieval (filing) systems, the effective use of study outlines and notes, the discriminating use of medical journals and texts, and the resourceful use of the medical library, computers, and telecommunication equipment. These skills are frequently overlooked by students as valuable learning goals in their own right.

Since the problems encountered in medicine are primarily those of individual patients, most problems and situations presented to the student relate to an individual clinical case. In this way, the learning is highly relevant and similar to the method by which many health professionals learn in real life. There are many advantages to this kind of learning: it contributes to the student's motivation; it encourages active intellectual process at the higher cognitive levels; it enhances the retention and transfer of information; it can be modified to meet individual student needs; and it encourages curiosity and systematic thinking.

CURRICULUM OUTLINE

Phase A (eight weeks). This phase of the curriculum is devoted to the theme of Communication and introduces the student to medicine, to the Mercer educational system, and to the community of central and southern Georgia.

This summary was drawn from testimony presented by Dr. Ralph Berggren at the AAMC Southern Regional Hearings held February 24-25, 1983.

Phase B (20 weeks). This phase is centered around the themes of Cycles, Continuums, and Homeostasis. Students learn about the human organism and its response to the environment. Issues are studied in greater depth, and the students become proficient in the problem-based method as they continue to develop self-directed learning skills.

Phase C (60 weeks). This phase is designed around the theme of Structure and Function in Health and Illness. It lasts until the end of the second year of the curriculum and is divided into five units with the following topics: (1) blood and gastrointestinal (12 weeks); (2) renal and endocrine (12 weeks); (3) heart and lung (12 weeks); (4) neurology and musculoskeletal (12 weeks); and (5) undifferentiated problems (eight weeks). In the section on undifferentiated problems, the BMPs are not separated by specific organ systems, but require the student to identify which organ systems are involved, and to work the BMPs through from very early signs and symptoms to ultimate management plans.

Beginning with Phase A and continuing through Phase D, there is an ongoing Clinical Skills Program. This aspect begins with simulated patient encounters to teach interviewing skills, and proceeds to elements of gathering a problem-oriented data base. Concurrently, simulated encounters are used to teach Anatomy for Physical Examination (APEX), where anatomical relationships and functional anatomy are taught in relationship to physical examination process skills. In Phase C, advanced interview techniques are taught.

During Phases B and C, each student is assigned to a community physician in the middle Georgia area as part of the Community Office Practice Program. One-half day every other week is spent in this community experience, where the student can observe an accomplished primary physician, as well as practice the clinical skills learned in the simulation exercises.

In Phases D and E, the students work in the major clinical clerkships, where the clinical and office skills learned previously are utilized to master the content and skills of the major clinical disciplines: family medicine, internal medicine, obstetrics/gynecology, pediatrics, psychiatry, and surgery. Elements of basic and behavioral science and medical ethics are intertwined with these clinical experiences for reinforcement in the context of actual clinical situations.

Part of the mission of MUSM is to prepare physicians who will practice in a community-responsive manner, with skills in identifying and evaluating community-level problems and utilizing or developing resources to solve them.

A Community Responsive Curriculum program matches each student to a small rural Georgian community where the student is involved in community activities for blocks of time in Phases A, B, C, and E. The student practices with a sponsoring physician and studies at least one community health issue in depth. This study provides an opportunity to learn elements of community and public health, epidemiology, research, leadership, and management, as well as civic, political, and social skills.

UNIVERSITY OF MIAMI SCHOOL OF MEDICINE

For Additional
Information, Contact: Jonathan J. Braunstein, M.D.
Associate Dean for Curriculum
Post Office Box 016159
Miami, FL 33101
(305) 547-6180

Faculty and students at the University of Miami School of Medicine addressed some of the issues raised by the AAMC booklet "Charges to Working Groups" in the following activities:

1. The Curriculum Committee undertook a thorough review of the curriculum, beginning the task by drafting a new set of educational objectives for the school. A list of guidelines, dealing with course content, instructional methods, and student evaluation, were also developed to aid the committee in determining whether or not courses were following these objectives.

2. Monthly meetings of the basic science and clinical course coordinators were held to discuss the existing teaching programs and to exchange ideas about how these might be improved. Student representatives, the Associate Dean for Education, and the Chairman of the Curriculum Committee regularly attended these meetings, as did consultants in Medical Education, who helped guide the discussions and provided the necessary expertise in educational matters.

3. A program of Faculty Development was instituted in which educational consultants worked with the faculty to improve their instructional skills and helped them to develop more effective teaching strategies. Faculty Development workshops, which focused on the particular departmental concerns, were held for basic science and clinical departments.

In addition to these activities, several new educational programs were introduced to deal with important curricular issues. One of these issues was the tendency for students in the basic science years to become too immersed in the scientific aspects of medicine, due in part to a lack of meaningful patient contact. To help students develop a broader and more humanistic perspective, last year's freshman Introduction to the Patient course adopted a new format in which students interviewed patients at their homes, beginning in the second month of school. Following these interviews, the students, in groups of seven, met with faculty (a clinician and a social worker) to discuss their experiences. The emphasis in these discussions was on the psychosocial as well as the medical problems presented by the patient. Later in the year, the students visited private physicians' offices and interviewed patients in that setting.

Sophomore Pathology introduced a new system of testing that allows each student to set the time when he is examined. If a student passes the exam at the first of the three levels of achievement with a score that is satisfactory to him, he goes on to level two. If, however, he is not satisfied with his score, he may retake the exam to demonstrate a better understanding of the material. This process is repeated for levels two and three. This system deals successfully with several educational issues. First, it allows students to learn at their own pace. Second, it encourages them to develop high internal standards of performance.

Finally, attempts have been made to promote closer faculty/student interaction in order to provide students with frequent and more meaningful feedback about their performance and also to give them opportunities to develop and use problem-solving skills. In the basic science years, more curriculum time has been spent in small-group discussion sessions and less in lectures; in the junior clerkships, more emphasis has been given by the faculty to bedside teaching, especially the direct observation of students while they examine patients.

MICHIGAN STATE UNIVERSITY COLLEGE OF HUMAN MEDICINE

For Additional
Information, Contact: Lynda J. Farquhar, Ph.D.
Assistant Dean for Educational Programs
A-254 Life Sciences Building
East Lansing, MI 48824-1317
(517) 353-5440

Michigan State expressed six major institutional concerns:

1. Concerns that knowledge in the disciplines (behavioral, biological, and clinical) that underpin the profession of the physician has increased so dramatically in recent years, and medical education has not come to grips with the problems inherent in this explosion (i.e., what should be known, how much should be immediate recall versus stored and later retrieved, how does one evaluate the student).

   a. Less than appropriate emphasis on the psychosocial component of medical education, at both premedical and medical levels. Further, a variety of other areas such as epidemiology, health economics, prevention, health education, and promotion are also too seldom given adequate attention.

   b. The overemphasis on detailed content and secondary underemphasis on integration and problem-solving.

   c. The emphasis of National Board certifying examinations on facts, which has a tendency to focus the content of curricula.

   d. Suppression of innate curiosity and lack of stimulation of continuing learning resulting from the overemphasis on facts (as opposed to concepts and problem-solving) during the undergraduate curriculum.

2. Given the necessity in 20 years of physician interdependence with information management technology, the concern is that computers play such a minimal role in the education and evaluation of medical students today. In addition, faculties are not using information management technology as fully as possible in assessing and modifying educational programs.

3. The difficulty of financing medical education, both by the student, the resident, and the society, and its potential long-range impacts.

4. Concerns that medical students are losing contact with research and laboratory experience, as well as the history of science, the contributions of research, and research methodology.

5. Given the postulated nature of the ideal physician in the next decade or so, are medical students being admitted to medical school with the personal qualities who can be trained to cope with the practice of medicine in the future?

6. Concerns about the stress involved in the role of medical student and/or resident. The problem arises most acutely when the faculty neither recognizes the stress nor provides opportunities for students to deal with this in an open way.

UNIVERSITY OF MINNESOTA, DULUTH, SCHOOL OF MEDICINE

For Additional
Information, Contact: Omelan A. Lukasewycz, Ph.D.
Assistant Dean
2400 Oakland Avenue Room 111
Duluth, MN 55812
(218) 726-8873

The following emerged as preeminent concerns facing medical education in general and the University of Minnesota/Duluth in particular:

1. Time constraints are of primary concern. Minnesota/Duluth has initiated a review of the curriculum to address this problem. While the curriculum format is very traditional (biochemistry, anatomy, and physiology in Year I; pharmacology, microbiology, and pathology in Year II), they are reviewing the curriculum by organ systems (endocrine, cardiovascular, etc.) and thus analyzing and evaluating the offerings in the broader view--transcending typical departmental domains. They are classifying learning objectives as: (1) vital (must know) information essential to practice; (2) must know about concept so it can be looked up when needed; and (3) not of immediate clinical use but faculty believe it will be important in the future. They feel this methodology will help assess the situation in this most critical aspect of medical education.

2. Another major concern dealt with the use of tests, specifically the MCAT and the NBME. It was realized that students will react to the intent of these exams both at the entry level (MCAT) and at the licensure level (NBME Part I, Part II, and Part III) and will tend to ignore such knowledge as is not required within this context. It appeared obvious if one desired a more liberally-educated or more problem-solving oriented individual to enter medical school, or a medical student more involved in essential knowledge once in medical school, that the respective tests needed to be revamped to include those desired offerings.

3. Another area of concern was that of teaching effectiveness. It was pointed out the rewards for good teaching are absent or minimal at best and you usually get what you pay for.

4. While many schools would appear to prefer a more liberal education of their candidates, the fact remains that applicants to medical school know by contacts with medical school colleagues that a heavy dose of relevant science courses (histology, microbiology, biochemistry) is most helpful, and perhaps necessary, to survive the punishing medical school curriculum. Minnesota/Duluth has made some inroads into this dilemma by requiring a specified number of psychology/behavioral science courses of all candidates. The moral appears to be that desirable traits must be specified in admission criteria and not simply dreamt about.

UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MEDICAL SCHOOL

For Additional
Information, Contact: Robert J. McCollister, M.D.
Associate Dean for Curriculum Affairs
420 Delaware Street, S.E.
Minneapolis, MN 55455
(612) 373-9582

The Dean appointed a special task force in February 1981 to examine the goals and objectives of the medical school curriculum and make recommendations for change. Seven major areas were cited for improvement.

1. Congestion in basic science courses. Information overload, compacted curriculum, and large class size dictate an educational approach emphasizing lectures and regurgitation of facts in tests at the expense of more individualized educational approaches, emphasis on concepts, and integration of material.

2. Problems of quality, lack of coordination, and timing (too early) in the clinical tutorial program in the second year.

3. Problems in the sequence and the progression of the educational process.

4. Examinations that are too frequent and that emphasize recall of facts.

5. The large class size has created "a correspondence school atmosphere" where students use lecture notes of others, etc.

6. The mechanism for continuous review and evaluation of the curriculum needs strengthening.

7. The option to graduate in three years is not often justified.

A total of 44 recommendations have been developed in response to these concerns, among which are the following:

1. Decongest basic science instruction in year one and move selected content areas to year two.

2. Increase use of small group tutorials and individualized learning.

3. Develop honors curriculum and elective and accelerated courses.

4. Present a course in basic science clinical correlations in the first year to promote relevance of basic sciences to clinical problems and approaches to problem solving.

5. Use of mid-quarter examinations and quizzes to determine the final grade in a course should be minimized.

6. Course directors should vary the examination format to include essays, open-book tests, fill-in, and short answers whenever possible.

7. Reduce clinical instruction in year two and increase emphasis on pathophysiology.

8. An adviser should be assigned to students early in year one and continue throughout year two.

9. Advisers should be trained prior to their assignment.

10. A residency adviser should be chosen in the early-to-mid portion of the student's third year.

11. A special task force should be appointed to analyze the diverse problems associated with the large class size.

12. The following strategies should be implemented to reinforce the esteem and prestige traditionally linked with excellence in teaching:

   a. Department heads should have as a high priority the development of excellence in medical student teaching within their departments and should serve as strong advocates for continuing improvement in the overall medical school curriculum.

   b. The policies for faculty promotion and tenure should be reviewed and strengthened to reflect both scholarship and teaching.

   c. Faculty comprehension of the criteria for academic promotion and the granting of tenure should be strengthened.

   d. The methods for recognizing distinguished teaching should be expanded and enhanced.

   e. Sabbaticals designated for and broadly oriented toward enhancement of medical education should be granted.

UNIVERSITY OF MISSOURI, COLUMBIA, SCHOOL OF MEDICINE

For Additional
Information, Contact: Wallace Rogers, M.D.
Interim Associate Dean
One Hospital Drive, M228
Columbia, MO 65212
(314) 882-1566

The Education Council of the University of Missouri-Columbia School of Medicine has organized and directed a detailed study of the General Professional Education of Physicians (GPEP), as part of the nationally coordinated survey outlined by the Association of American Medical Colleges. The Education Council makes the following recommendations to the Dean of the School of Medicine and the Faculty.

1. Maintain a depository for all course materials given to our medical students. This should be updated annually and continuously. It should provide a central source for curricular content information. It should include objectives, schedules, handouts, reading requirements, tests and note sets as used in each course. It should be maintained by the Dean's Office or Education Council.
2. Improve communications with nearby undergraduate colleges and premed advisors in an effort to apprise them of our admission requirements and process.
3. Study the application of computer technology across the breadth of medical education.
4. Institute a detailed study of a voluntary advisory system to promote informal role model contacts between faculty, M-1s and M-2s.
5. Appoint a faculty-led committee to assess, and consider reorganization of the social & behavioral sciences course work in years one and two. Portions of the content should be delayed to the M-3 - M-4 year as part of a required experience.
6. Convince each current course or clerkship to obtain one or more diverse and extra-departmental advisors to regularly study their course and report to that department, the Education Council, and the Dean. Advisors would be patient-oriented faculty for foundation courses, and research-oriented faculty for clinical clerkships. The advisors would attempt to:
    a. improve foundation/clinical communication
    b. reduce core lectures
    c. increase small group discussions
    d. emphasize problem solving and clinical cases
    e. apply computer technology
    f. develop special projects for student initiative
    g. promote literature evaluation skills
    h. expose students to health care team concepts
7. Study and alter admission requirements to reflect the need for a broader undergraduate education with more humanities specified, one computer science course as partial satisfaction of the mathematics requirement, and nutrition as an alternative to a biology/chemistry course, with some suggestion as to level or intensity of courses required.
8. Study current medical school and university guidelines for promotion and tenure, with the intent to better reward able teachers.
9. Study the feasibility (effect and implementation process) of an independent study project requirement and/or institutional examinations for medical students.

UNIVERSITY OF MISSOURI, KANSAS CITY, SCHOOL OF MEDICINE

For Additional
Information, Contact: Harry S. Jonas, M.D.
Dean
2411 Holmes Street
Kansas City, MO 64108
(816) 474-4100

UMKC School of Medicine was established in 1971 to develop an academic course of study for future physicians that would create (1) an appropriate environment for learning; (2) a curriculum relevant to the needs of future physicians through the integration of clinical and basic sciences as well as humanities in a combined baccalaureate/medical degree program; (3) a reliance on student-initiated learning and independent study with special emphasis on the Socratic method of interactive learning rather than didactic methods; and (4) a structure that provides a strong emphasis on the importance of adequate faculty role models and the need for close interactive relationships between students and faculty.

Major institutional concerns are to provide an educational environment that has the following characteristics:

1. It adequately prepares students for the challenges of lifelong learning.
2. It promotes the psychological well-being and intellectual growth of physicians of tomorrow and combats the trend toward depersonalization.
3. It has a curriculum that is integrated and relevant, in which the basic precepts and applications of the basic and clinical sciences are reinforced.
4. It emphasizes scholarly inquiry.

To meet these concerns, the UMKC School of Medicine is fully integrated in teaching liberal arts/humanities, basic sciences, and clinical medicine. Students are enrolled concurrently in the College of Arts and Sciences and the School of Medicine. To reduce competitive stress, students are admitted from high school; small-group teaching is employed; a credit/noncredit grading system is nonthreatening; and an extensive student support system assists students. Considerable course work is devoted to problem solving.

UMKC faculty routinely review the substantive and basic facts essential to the discipline of medicine. Course work and clinical clerkships have been specifically designed to accommodate the relevance and importance of new technology and biomedical discoveries. In addition, the close student/faculty relationships and small-group basis of learning are yet other techniques where the rapid expansion of medical knowledge and information is discussed, integrated, and reviewed. The objective is to assimilate the ever-increasing body of medical information and deliberately to sift from this immense information base essential skills or new discoveries that enhance continued learning.

MOUNT SINAI SCHOOL OF MEDICINE

For Additional
Information, Contact: Barry Stimmel, M.D.
Dean for Academic Affairs, Admissions, and Student Affairs
Mount Sinai School of Medicine
100th Street and 5th Avenue - AN 512
New York, NY 10029
(212) 650-6694

In participating in the GPEP project, the Mount Sinai School of Medicine instituted a modified Delphi Survey. The following describes the survey conducted and summarizes the most salient findings.

METHODS

In an attempt to provide as broad a base of participation as possible, representative samples of administrators, deans, chairmen, course directors, full-time basic science and clinical faculty, voluntary attending staff, students, and alumni were invited to participate. In addition, in order to allow participation by those institutions that provide the School of Medicine with applicants, invitations were also forwarded to premedical advisers.

The construction of the actual survey was accomplished in accordance with the recommendations of the AAMC working groups. In addition to the three major categories addressed by the AAMC committees, a fourth was added to express predictions over the next ten years concerning the future of the National Board Examinations; essential changes in society, technology, and medicine that might markedly affect the nature of essential knowledge; changes needed in the medical curriculum to accommodate these events; and the future interactions of physicians with other health care professionals. Phase I of the questionnaire, forwarded to those individuals who indicated a willingness to participate, requested responses to each of the items within each major grouping. No more than three or five responses, depending on the specific item, were allowed. All responses were anonymous; however, the questionnaires were coded to identify the groups to which respondents belonged.

When responses were received to Phase I, all duplicate responses were eliminated, with each distinct response included within each item. Phase II of the questionnaire was then forwarded requesting the respondent to indicate whether each distinct item within each major item was (1) essential (required); (2) important (but not required); (3) useful; (4) of minimal value; or (5) of no value. In the section dealing with ten-year predictions, the respondents were asked to indicate if they (1) strongly agreed; (2) agreed; (3) had no opinion; (4) disagreed; (5) strongly disagreed with each of the predictions. Coded optical mark sense sheets were utilized to allow the response to be directly recorded in a format for optical scanning. Once the answer sheets were checked for suitability for processing, they were read into the computer for analysis.

The grading system used ranged from 0 for "essential" to 4 for "no value," and 0 for "strongly agreed" to 4 for "strongly disagreed." Median scores from all respondents were calculated for each item, with median scores then recalculated by categorization of respondents by title and educational background. Statistical differences between groups were calculated by use of median tests and chi-square tests, with all results reported if the alpha value was found to be less than 0.05.

In analyzing the frequency of the responses to the ratings, it was noted that those items with a median score of 0.5 or less had greater than 60% of respondents considering that item to be essential (required) or indicating a strong agreement with the prediction. Items with a median score of less than 1.0 had 85% of all respondents indicating that the item was either essential or important. Those items of median scores greater than 3 represented items considered by 80% of the respondents to be of minimal or no value.

RESULTS

Of 364 individuals invited, 133 (36.4%) chose to participate in Phase I, submitting 591 distinct items, with 124 completing and returning Phase II. The demographic analyses of respondents revealed each category to have a sufficient number to conduct tests of statistical significance among groups.

Undergraduate Preparation for Medical School. Out of 30 items initially identified as being essential for undergraduate students to prepare them for medical school, only (1) General Biology; (2) General Chemistry; (3) Organic Chemistry; (4) English Composition; and (5) General Mathematics (excluding Calculus) received scores less than .5. Of 19 items felt to be essential skills to be developed while attending college, 8 received scores indicating that these skills were required: (1) Problem solving; (2) Listening; (3) Analysis; (4) Efficient study/learning habits; (5) How to study; (6) Ability to work with people; (7) Communication skills; and (8) Library use. Surprisingly, little consensus could be obtained concerning 18 items initially listed as being essential to assess knowledge gained in college. Course grades and faculty evaluations were the only items receiving less than a .5 score. Similarly, ways considered to be essential to assist undergraduate students to develop those desirable personal attributes for the study of medicine found only two items of 24 (stressing integrity and honesty and treating students as human beings) to score less than .5. Undergraduate values that might prevent a student from developing these desirable personal attributes listed two out of 22 as extremely important: (1) not tolerating unethical students behavior and (2) unethical teaching. Consensus could not be obtained on 23 items listed as techniques medical school admissions committees could use to assess personal attributes of physicians, with only five being listed as important.

The Medical Curriculum. In this section, 4 out of 12 items were considered essential to help students retain basic knowledge: (1) understanding of principles versus memorization; (2) identification of core principles for each discipline; (3) requiring basic science in subsequent clinical work; and (4) repetition of knowledge gained. Essential principles to help students retain essential clinical knowledge complemented those of the basic sciences. Essential ways of presenting educational material more effectively emphasized relevance, enthusiasm on the part of instructors, and increased training in decision-making and problem-solving.

Consensus could not be obtained with respect to required courses not presently taught in the medical school curriculum. The respondents were able to identify a number of essential skills needed to be developed in medical school, not able to be found in college. However, the ways that faculty could help in assisting the development of these skills did not generate a similar consensus. Only 3 out of 27 items (adequate supervision, use of problems in case discussions, and guided patient contacts) received scores less than .5. Similarly, essential methods of testing student acquisition of these skills resulted in only two items (observation of students during their rotations and bedside examination and problem-solving tests) receiving a .5 score or less. The ways that faculty and administration can help students cope with stress consisted of 19 items. Of these, 10 received scores of less than .5, suggesting that many ways exist to allow stress to be alleviated.

Personal Attributes of Physicians. This section revealed 16 of the 36 desirable attributes to be considered essential, with integrity, honesty, and responsibility most important. The essential ways of assisting students to develop these attributes centered around making certain that faculty who provided good role models were retained in the teaching process, with others eliminated from student contact. Almost all of the 32 items listed as being attributes incompatible with being a physician were considered as important. Methods by which faculty can promote positive aspects of competition while simultaneously discouraging negative aspects to get ahead contained 25 items, seven of which were considered to be essential. These seven dealt with (1) establishment of proper role models; (2) dealing severely with unethical behavior; (3) treating students with respect; (4) setting realistic expectations; (5) emphasizing motivation rather than competition; (6) establishing clear criteria for adequate course performance; and (7) rewarding achievement.

Ten-Year Predictions. The predictions concerning the future of the National Board Examinations did not yield any of the 22 items with ratings of less than .5. It was, however, agreed that changes in computer technology and improved diagnostic tools would be the most important of the technological advancements to affect the nature of essential knowledge. The role of electronic data retrieval systems was found to be the most important in future medical education.

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE

For Additional
Information, Contact: Robert T. Binhammer, Ph.D.
Associate Dean
42nd Street and Dewey Avenue
Omaha, NE 68105
(402) 559-4205

Teaching Essential Concepts. There is agreement that the structure and content of the teaching program is so dependent upon the nature of the testing program that the latter must be evaluated and changed before there will be change in the former. As long as there is complete dependence upon objective-type examinations, it will be very difficult to limit teaching to essential concepts. Students would like to use case study approaches beginning with the first year.

Required Clerkships. Radiology and critical care medicine experiences should be added to the list of mandatory experiences. Clear definition of the residents' role in student instruction by providing a list of objectives for the resident would improve the experience. Group discussion sessions (sit down rounds) would be appropriate and helpful for learning differential diagnosis and general patient management.

Stimulating Independent Study. The faculty is very concerned about an educational process that tends to make the student a passive participant. In Nebraska's curriculum only the anatomy courses with laboratory sessions and the introduction to clinical medicine provide the students with opportunities for self-learning. It is difficult to expect students to be independent learners if they have not been expected to practice. Many feel that each course director, at minimum, should include in the course study one exercise that sends students to the library for research or in some way expects students to conduct an independent study.

Modifications in Educational Strategy. A new course in the Introduction to Clinical Medicine is about to be implemented. It will have as its core the introduction to the patient and physical diagnosis. However, gradually it will incorporate more than a half dozen disciplines now separately taught. These would include introduction to primary care, medical humanities, introduction to medical ethics, epidemiology, neural sciences, reproductive medicine, aging, medical economics, and ophthalmology. Instead of separate courses in each, the material will be integrated in proper sequence. Seen as a major impediment to this approach is the desire of the instructor to have the recognition that accrues to those with a designated course in the curriculum.

Required Family Practice Preceptorships. Required two-month experiences with a family practitioner in a small town or rural territory are rare in American medical schools and seem limited to several schools in the southeastern part of the nation and to some extent in the Great Plains. The family practice preceptorships, which follow required rotations in internal medicine, surgery, and obstetrics and gynecology, provide students with experience that is seldom addressed in medical curricula. The preceptorships give heavy emphasis to ambulatory care providing students with insight about the continuity of care, enable the student to observe the management of an office, help students understand the importance of cost containment, give experience in dealing with common medical problems, and enable students to develop self-confidence because much responsibility can be given in a resident free atmosphere, and may reinforce the students' previous experience in surgery and obstetrics.

UNIVERSITY OF NEVADA SCHOOL OF MEDICINE

For Additional
Information, Contact: Neal Ferguson, Ph.D.
Dean of Continuing Education
Savitt Medical Sciences Building
Reno, NV 89557-0046
(702) 784-6001

An 11-member task force of faculty and students framed the following observations in response to the "Charges" booklet:

1. Admissions criteria are extremely narrow as evidenced by singling out MCAT science scores and emphasizing grade point averages.

2. Premedical and medical students are competitive to a level that is detrimental to them as individuals and as physicians in the practice of medicine.

3. The nature of premedical and medical education in general is too narrow and forces a singularity of focus that concentrates the energy of the student into acquisition of knowledge with little regard to issues of process and affect.

4. The primary educational methodology of medical schools today fails to prepare students for a lifelong career of learning and exploration.

5. The first two years of medical education are continually filled with course content reflecting a creation of new information in medical sciences without a concomitant review of the value of information that is retained in the medical school curriculum in those same first two years. This body of knowledge represents an amount of information that is simply not digestible in a meaningful way in the limited time period made available to students.

The following reflections on possibilities of addressing these issues were offered:

1. Continued societal demand for "scientific" documentation of selection processes and criteria seem to mitigate against the possibility of significant change in the criteria employed for selection of medical students. Nevada faculty hope, however, that students seeking admission will be required to have had coursework in ethics, the social sciences, and the liberal arts as well as the hard sciences.

2. With regard to the issue of competitiveness, the premedical majors are currently required to work as groups and to interact effectively to achieve a grade and/or an evaluation. Significant changes have also been recommended for basic sciences courses that would encourage students to work cooperatively and as groups. The development of a mentoring system for medical students has also been recommended to encourage and foster cooperation between students and faculty to provide students with adequate role models early on in their medical education.

3. With regard to concerns about the narrowness of general education of medical students and the narrowness of medical education per se, there have been

strong recommendations that course work and evaluation activities include patient management problems where the diversity of approach to valid answers can be modeled for students and experienced by them.

4. In response to the concerns that year one and year two course loads are extremely high, that new information is added without old information being deleted, a major curricular review will include close examination of all course work and courses included in year one and year two. Contact hours in the first two years are to be reduced to provide students with more time to accomplish group and independent work. A major review of the clerkship schedule scope and sequence in years three and four is being undertaken concomitantly.

UNIVERSITY OF MEDICINE AND DENTISTRY OF NEW JERSEY-NEW JERSEY MEDICAL SCHOOL

For Additional
Information, Contact: Elizabeth A. Alger, M.D.
Associate Dean for Education
100 Bergen Street MSB C-662
Newark, NJ 07103
(201) 456-5436

Major issues of concern to the New Jersey Medical School are the following:

1. An issue of fundamental importance is to define educational needs of future physicians and to ensure that the curriculum is providing adequately for them. Over the next two years an institutional goal will be to delineate the basic knowledge, skills, and attitudes the graduates should acquire. Evaluating those competencies will also be explored. Particular consideration is being given to including clinical aspects of geriatrics, oncology, nutrition, and rehabilitation. The school has 1½ years of required clerkships and will be engaged more in refining and redistributing than in restructuring the clinical curriculum.

2. A second issue of concern is the need to develop better means of teaching essential concepts and promoting critical thinking with less emphasis on acquiring factual information in the preclinical curriculum. As an approach to the problem of information overload and surfeit of lectures, faculty are discussing limiting the proportion of class time that may be devoted to lectures. Several of the basic science departments have begun to develop simulated clinical problems as the basis for expanded small-group conference teaching.

3. Developing teaching skills by faculty and learning skills by students is another area of concern. A series of lectures and workshops on effective teaching and other institutional efforts in this regard have attracted almost one third of the faculty. Lecture skills and the use of computers in medicine and medical education are the most popular topics.

4. Preparing faculty and students to use advanced computer-based information systems and telecommunications technology is of interest.

5. Development of a program of electives for first- and second-year students is aimed at supporting the professional growth of students: topics such as ethics, ethical decision-making, death and dying, history of medicine, cultural anthropology, medical computing, medical information systems, career planning, biomedical research, and ambulatory care clinic. A popular two-semester program, "Parenting and Professionalism," concerned with the balance between personal life and the demands of a medical career, has been shown to reduce both institutional and noninstitutional stress among participants.

The greatest impediment to improvement in teaching appears to be an effective system of rewards.

This summary was drawn from testimony presented by Dr. Elizabeth A. Alger at the AAMC Northeastern Regional Hearings held May 5-6, 1983.

NEW YORK MEDICAL COLLEGE

For Additional
Information, Contact: **Alan B. Rothballer, M.D.**
Associate Dean for Education and Curriculum
Elmwood Hall
Valhalla, NY 10595
(914) 347-5047

Excerpts from discussions by faculty and students at New York Medical College follow.

1. There appears to be a reasonably good correlation between MCAT scores (and GPA) and success in medical school, especially the first two years, and success in Part I of the National Boards. So we should be very cautious about lessening the importance of MCAT scores in the admission process. If done at all, it should follow, rather than precede, any changes in the first two years of the medical school curriculum (and its examinations, and Part I of the National Board).

2. Medical schools would benefit from an improved overall evaluation of applicants. Undergraduate colleges could help by providing some indication of the difficulty of courses, the comparability values for grades, and by providing individual more standardized and uniform evaluation by faculty.

3. Medical schools might actually require (as opposed to recommend) broad exposure to the humanities and reward excellence in non-biomedical areas as a way of countering the "premed syndrome."

4. The information overload is one of the central problems in the basic science years. There is a need for structured communication between the basic scientists and the clinicians most closely related (e.g., neuroscience teachers/neurologists and neurosurgeons) to achieve a form of "vertical" integration.

5. The decision-tree approach to clinical problems provided by the growing discipline of cognitive science constitutes an excellent model of the thought processes and actions that underlie medical practice.

However, medical education is criticized now because so much of it is spent learning large amounts of didactic material, an amount said to be excessive, and which is learned largely through memorization and then returned to the faculty (tested for) with multiple-choice examinations. All of this seems to have little to do with the plan by which practicing physicians function, a process for which decision-tree analysis is a much better model. Why not start off medical school then by learning to function according to a cognitive model which more closely resembles practice?

In carrying out this decision-tree process competently, the physician must first have an adequate data base (knowledge) in order to grasp and interpret the information input. In medicine, this will consist of anatomical road maps, normative values, and an understanding of normal and pathological processes. Secondly, the physician must master the skills involved in acquiring and evaluating such information (e.g., doing a history and physical; reading an x-ray), and in carrying out a therapeutic plan (e.g., administering medicine, doing procedures). Lastly, attitudes affect the manner in which the skills are exercised and inject a subtle but important value judgement which biases each decision point one way or the other. Thus medical education consists in giving students the knowledge data base, the diagnostic and therapeutic skills, and the attitudes and values to proceed along this decision-tree confidently and skillfully. We believe that the decision-tree model cannot be intelligently understood and remembered without first acquiring the data base, and that it cannot be utilized or applied without then learning the skills and adopting the attitudes. Only when these three processes are sufficiently advanced can medical teaching profitably switch from the didactic mode to the problem-oriented mode.

6. Clinical clerkships based on the case method of study are a very effective teaching format provided that the faculties involved are well trained clinicians interested in teaching and in students and that the house staff involved are aware of and prepared for their teaching responsibilities. Although the M. D. degree is granted to the student at graduation from medical school, he or she is not prepared for the unsupervised practice of medicine. In fact medical school prepares students for the next phase of their clinical education a post-graduate training program. This should be taken into consideration in the formulation and evaluation of the clinical curriculum in medical school.

Thought should be given to the interrelationship between the clinical education program in medical school and post-graduate training programs, for they are truly a continuum. There are now over 4,500 programs of graduate medical education in over 35 disciplines sponsored by some 1,500 institutions. Although all residency programs are regularly reviewed for accreditation by special accreditation committees, they vary tremendously in quality, supervision and educational standards. This area of medical education is poorly supervised and until recently most of the programs had little input from medical schools. More direct involvement of medical schools in the formulation of these programs would allow for a better planning of that clinical education spanning the last two years of medical school and the years of residency training. The question arises whether all post-graduate training programs should be carefully reviewed to determine if they provide adequate training in areas other than their particular specialty and if not whether this training should be provided in the fourth year of medical school or in the post-graduate programs or in both. For example consideration of medical ethics, cost of health care, community resources and health insurance can be introduced in medical school but can be more effectively discussed during internship and residency where they are more relevant.

NEW YORK UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Michael L. Shelanski, M.D., Ph.D.
Chairman, Department of Pharmacology
550 First Avenue
New York, NY 10016
(212) 340-7111

New York University School of Medicine is a private medical school, not a part of the state system; it is part of the largest private university in the United States. NYU is 140 years old and has been one of the five major producers of academic faculty in this country over the past 50 years. It has a firm commitment to developing researchers, clinical investigators, and clinicians for the community. All of this requires a very strong basic sciences base.

Faculty at NYU have continually monitored the process of medical education and engaged in a continuous, evolutionary modification of their curriculum to enable the incorporation of new and emerging areas. In doing so, they remain committed to the concept that a rigorous education in the traditional "basic medical sciences" is essential in the education of physicians who will have the intellectual tools to master the advances of the future. This mastery requires a strong factual foundation, a comfort with the method of scientific reasoning, and the development of a strong critical faculty. Above all it requires an inquisitive attitude and a desire to understand the totality of processes at work.

Significant curricular advances over the past decade have included the introduction of new courses in cell biology, immunology, neurobiology, and behavioral sciences. These interdisciplinary courses have been carefully integrated with the traditional basic science courses. Physical Diagnosis has been supplanted by an extensive introduction to clinical medicine designed to integrate the materials of the first two years and provide a bridge between the two components of the curriculum. During the first two years students are invited to participate in the journal clubs and literature discussions of the Honors Program and are offered the chance to devote summer and elective time to either basic or clinical research as part of this program. In the third year each student must prepare, present, and critically discuss a series of papers from the literature as a required part of his or her training.

During this period the faculty have perceived a lessened excitement for critical analysis among the students and have questioned whether this might reflect changes in undergraduate education. Specifically, they have wondered whether "grade inflation" has resulted in the loss of the concept of "excellence," and also whether the colleges have not overreacted to the difficulty of medical school admissions by producing courses that are long on facts tested by the MCAT, and short on the mastery of difficult concepts. Finally, faculty have felt the result of "cream skimming" in undergraduate courses, which often provide the student with an in-depth introduction to molecular biology while

---

This summary was drawn from testimony presented by Dr. Michael Shelanski at the AAMC Northeastern Regional Hearings held May 5-6, 1983.

glossing over the more tedious and conceptually difficult areas of molecular structure, thermodynamics, and metabolisms. In now falls to the medical school to carry out the fundamental education in an inversion of the normal sequence in graduate education.

As part of a large urban university, the New York University School of Medicine offers its students access to M.D./Ph.D. programs in the social sciences as well as the biological sciences and through the Humanities Council offers its medical students an ongoing education in the humanities and social sciences.

STATE UNIVERSITY OF NEW YORK, BUFFALO, SCHOOL OF MEDICINE

For Additional
Information, Contact: Stuart L. Keill, M.D.
Psychiatry Services (116A)
VA Medical Center
3495 Bailey Avenue
Buffalo, NY 14215
(716) 862-3670

The School of Medicine of the State University of New York at Buffalo is seriously committed to the current review and appraisal of general professional education of the physician and in college preparation for medicine. Participation has been active, both at the national level in collaboration with the AAMC project panel and staff, and the other schools of medicine, and locally. Utilizing the stimulus of the national project, SUNY/Buffalo reviewed and appraised its present situation and developed recommendations and strategies to improve their effectiveness.

1. The first step in the procedure had been to stimulate broad discussions among the components of the School of Medicine concerning philosophies and approaches to medical education, college preparation for medicine, essential knowledge, fundamental skills, and personal qualities for faculty and students. To initiate this, the Dean appointed a committee representing the faculty of the preclinical and clinical departments, graduate medical education faculty, school and hospital administration, and housestaff and undergraduates in the School of Medicine. The committee requested the faculty department chairmen, the chairman of the standing committees of the Faculty Council, and the Presidents of the undergraduate and graduate students to generate discussion within their constituent components and to identify a representative to coordinate future activities within the components and to serve as a liaison with the School Committee.

2. The constituent groups, through internal discussions, actively assessed programs based on findings of the national body. In addition, the Committee sponsored presentations at open meetings that involved broad representation from the student body and faculty.

3. These efforts helped develop appropriate strategies to improve the long-range effectiveness of SUNY/Buffalo's instructional programs in an attempt to further ensure a lifelong commitment by pnysicians to learning with the process beginning long before the actual matriculation in the School of Medicine.

Initial communication resulted in a broad consensus on the relative importance of the assumptions delineated in the AAMC "Charges" booklet. This consensus heartily endorsed the general assumptions. The following priorities emerged: (a) 57% of the responders listed assumption 3.2 (need to stimulate curiosity and learning skills); (b) 47% of the responders listed assumption 2.2 (develop independent learning skills); (c) 35% of the responders listed assumption 1.4 (importance of a broad humanistic background); (d) 30% of the responders listed both assumption 2.5 (basic diagnostic clinical skills) and assumption 2.6 (clinical skills and clerkships); and (e) 26% of the responders listed assumption 3.4 (concerns for patients' welfare), assumption 1.4 (importance of computer systems), and assumption 1.6 (scientific applications).

SUNY/BUFFALO PAGE TWO

The other assumptions, with the exceptions of 1.3 (using the MCAT to identify essential knowledge); 1.10 acquiring knowledge from special areas); 1.11 (Using NBME exams to measure achievement of essential knowledge); and 3.6 (coping with emotional stress), were represented by between five and 25% of the responders to the questionnaire.

During the period of May to October 1983, the constituent local groups continued to discuss the issues. An open hearing of faculty and students will be held in the Fall following report of the next phase of the nationwide process.

In a recent communication, Dr. Keill informed the AAMC of their continued discussions not only in committee, but also two faculty members in the Department of Psychiatry who are also concerned with admissions have gone in some depth into problems of detection and selection of medical students at risk for psychiatric illness at SUNY/Buffalo. This led to discussions with members of faculties of other schools with similar interests and experience. This, in turn, led to the development of a proposed symposium entitled "Psychiatric Risk and the Education of the Physician" for presentation at the Annual Meeting of the American Psychiatric Association in May 1984. Topics of the presentations proposed are: (1) impairment prevention for physicians in training; (2) cheating in medical education: (3) predictors of risk in admission screening; (4) identification and treatment--a national survey; and (5) primary prevention during the premedical years.

The SUNY/Buffalo report should be completed in January 1984.

STATE UNIVERSITY OF NEW YORK, UPSTATE, COLLEGE OF MEDICINE

For Additional
Information, Contact: A. Geno Andreatta
Dean for Admissions and Student Affairs
155 Elizabeth Blackwell Street Room 202
Syracuse, NY 13210
(315) 473-4816

In their discussions, SUNY/Upstate faculty and students identified seven key institutional concerns:

Science and the Humanities. An artificial dualism separating science from the humanities has influenced criticism of medicine and medical education over the last two decades. In essence, this dualism ascribes more superiority to the humanities and social sciences while ignoring the fact that rational science is one of humankind's greatest cultural achievements. In so doing, it has created the unfortunate public stereotype of the physician-scientist as an unfeeling technocrat. It has forced the introduction of a variety of "fashionable" subjects into an already overcrowded curriculum. More seriously, it has caused an undetermined but significant number of medical students to discount the value of a career in clinical research. The participants in these deliberations were concerned that the assumptions given in the Charges to the working groups ignore this problem, and SUNY/Upstate asserts that their most unique and humane social function is the teaching and development of scientifically qualified practitioners and researchers. To this end, in spite of financial constraints, they have developed an academic/research option to provide 36 weeks of full-time laboratory experience over the four years of the medical curriculum.

Memorization and Problem Solving. A second artificial dualism found in the assumptions given to the working groups is the separation of the cognitive structures of concept formation and problem solving from prerequisite memorization of factual material. Factual knowledge does not necessarily equate with understanding but it is essential to achieve understanding.

Development of Desirable Traits. Medical student values and behavior are influenced to varying degrees by their mentors. For this reason, medical faculties must be chosen and rewarded not only for their scientific productivity and clinical proficiency, but also for their effectiveness as teachers and for their manifest respect for students and patients.

Analysis of Scientific Literature. In its current form, the medical curriculum is inadequate for teaching careful analytical reading of medical literature. While these skills are more important than ever, the students seem no better prepared and are, in many cases, less prepared than in the past.

Evaluation of Clinical Skills. There was general agreement that the definition of skills appropriate to the undergraduate and graduate levels of medical education by national groups in primary care and the specialties would be most helpful. However, the participants also pointed out that none of the assumptions touched on the means by which such clinical and interpersonal skills are evaluated. Faculty devote too little time to the observation and development of individual students' history gathering and physical examination skills.

Measurement of Personal Qualities. The personal qualities one should find in both medical students and physicians alike are easy to list but difficult to measure. Until reliable criteria for physician performance are developed, any scientific attempt to demonstrate correlation with measures of student selection or medical school performance will be frustrated.

Specialization and Fragmentation. The pursuit of specific and advanced knowledge has required specialization in narrowly defined areas of basic and clinical science. Medical college faculty each have a perspective on their own area of interest but are not as well informed on the curriculum as a whole. Medical students are left to absorb and synthesize a large amount of what appears to them to be disparate information.

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE

For Additional
Information, Contact: William E. Bakewell, M.D.
Associate Dean
Chapel Hill, NC 27514
(919) 962-8331

The University of North Carolina School of Medicine is part of a state-supported university system, which has offered medical instruction since 1879. Its four-year program was established in 1952, when the University Hospital was opened in Chapel Hill.

The first curriculum review, in the late 1960s, resulted in changes that were implemented in 1970. The current curriculum review has consisted of three phases: a preliminary study, which began in 1980 and resulted in a proposal for a Task Force to review the curriculum, which was approved by the faculty; the actual review, which began in August 1981 and was expected to be concluded by Spring of 1983; and the third phase, implementation planning to run through the next year, with the introduction of the new curriculum planned for the fall of 1984.

At the time of the hearings, the faculty were reviewing their final report, and they had not yet acted upon it. In the revised plan, the traditional four-year format will be retained: the first two years of preclinical education, the third-year required clinical clerkships, and the fourth-year electives. Among recommendations it contained were the following.

Lectures limited to three hours per day with less required reading and fewer prepared handouts and at least two free afternoons a week were proposed. More small-group teaching and problem-solving exercises, more selective seminars to emphasize critical thinking and reading of the medical literature, in-depth study, and oral presentations in small groups were also proposed. A faculty member will lead each seminar, and personal subjective written evaluations on each student will be submitted at the end of each period.

It is recommended that a main teacher be in charge of each course to coordinate the efforts of others in the course; that course directors within each year meet periodically to integrate what they are presenting; and that content areas be integrated longitudinally throughout the four years. They identified three content areas: (1) the biomedical sciences; (2) clinical skills; and (3) social sciences, behavioral sciences, and humanities. The first, the major topic of the first two years, will probably account for 90% of the curricular time. An increase in the use of clinical correlations to illustrate basic science concepts in the first two years is recommended, as well as greater efforts to reinforce biomedical science concepts in the clinical years. It is recommended that one of the three selective seminars will be required in a basic science or biomedical science content area. Recommendations in regard to clinical skills are that an integrated plan of presentation and evaluation be

---

This summary was drawn from testimony presented by Dr. William D. Mattern and Dr. Romulo Colindres at the AAMC Southern Regional Hearings held February 24-25, 1983.

developed throughout the four years; an observed history and physical examination at the end of the physical diagnosis course in the second year; and another observed history and physical exam be done in the first clinical clerkship during the third year. It is recommended that a first-year course in social and cultural issues be retained, as well as a course called Introduction to Medicine.

North Carolina is recommending that special interest working groups be developed for each of the following areas, to bring their ideas on how the content could be integrated and presented throughout the four years: aging, occupational and environmental health, health promotion and disease prevention, social and cultural change, economic issues, health care delivery and cost containment, information management, the use of computers, and other topics that may be identified.

In regard to student evaluation, they recommend less reliance on end-of-the-year externally prepared exams, such as the National Boards, and less reliance on multiple-choice, fact-recall-oriented formats, and greater emphasis on testing for problem-solving capabilities.

It was also recommended that the authority and the responsibility for the management of the curriculum be assigned to a single individual, who will be called the Associate Dean for Academic Affairs. This individual should have the authority to actually make changes in the curriculum with proper safeguards, so that the interests of the faculty are represented. This individual should be advised by a small group of individuals appointed by the Dean, but not representing special interest groups, and that this advisory group should have two or three missions: (1) to integrate content areas; (2) to identify the working groups to pursue special topics; and (3) simply to think about the curriculum in an ongoing way.

UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE

For Additional
Information, Contact: Dwayne A. Ollerich, Ph.D.
Associate Dean
501 Columbia Road
Grand Forks, ND 58201
(701) 777-2521

In the last 10 years the University of North Dakota became a four-year, M.D.-degree-granting school. In 1978 plans began to initiate the third year of the program at North Dakota in 1982. Extensive study and evaluation of the curriculum were done at that time, a part of which was development of a "Graduate Outcome Statement," which described the school's expectations for the M.D. graduate. Plans included the development of a curriculum that would provide continuity between undergraduate and medical education; incorporation of clinical problem-solving methodology and experience at all levels; strengthening the behavioral and social sciences so that patients can be viewed as human beings in a human social structure; defining what base of knowledge and skills all students should know; development of experiences to foster independent learning skills and instill the desire to learn; introduction of techniques of information collection, management, and retrieval; development of experiences to make basic science material meaningful in a clinical problem-solving context; examining the impact of the educational process on behavioral attitudes; examining the admission requirements for the School of Medicine relative to essential knowledge base and graduate product statement; and development of a five-phase curriculum that provides appropriate education input and support for the significant transition periods in a student's career. The five phase program suggested was: Phase I--a transition phase from the college environment to the medical school environment; Phase II--a basic science segment with a recommendation that the basic science program be shortened and that basic science information be included in the clinical segment while clinical instruction would be started during the basic science segment; Phase III--a transition phase between the basic science segment and the clinical sciences segment; Phase IV--a clinical science segment with basic sciences included as a requirement in all clinical clerkships; Phase V-- a transition phase between clinical sciences and the postgraduate training program.

Reactions from North Dakota to several issues raised in the GPEP Project follow:

Information management and computers will impact significantly on the future practice of medicine and therefore should also impact medical education. Entering medical students should be familiar with computer technology; with how computers are used in independent learning; with basic uses and applications of computer technology; with basic computer hardware and software; and with personal skills needed to operate the computer terminal.

The Curriculum Committee has directed that at least 25% of instruction in each course be available in modes other than the lecture.

Since physicians are primarily problem solvers, it seems reasonable to suggest that independent learning and problem solving skills are inseparable in medical education and that the development of such skills and attitudes should begin early in medical education. The number of contact hours in the first two years of the former traditional curriculum was reduced by about 200 contact hours in place of which a clinical problem-solving course, called Focal Problems, was developed. This is a modified problem-based learning experience conducted in a small group format facilitated by a clinician and a basic scientist that utilizes PBLM's of various kinds as well as simulated patients. The course has been extremely well received by faculty and students alike. In addition to learning content, students are introduced to clinical material early in their educational experience and receive experience in clinical problem-solving methodology. The course has clarified the usefulness of basic science in clinical problem solving, fostered independent learning as well as responsibility to a group of colleagues, opened a dialogue between basic science and clinical science faculty members, and has provided a forum for the discussion and exchange of ideas over issues in medicine such as the cost and delivery of health care, social and family issues, patient education, compliance, ethics, etc.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL

For Additional
Information, Contact: John F. Snarr, Ph.D.
Associate Dean for Student Affairs
303 East Chicago Avenue
Chicago, IL 60611
(312) 649-8206

Formal college and medical education is designed to prepare physicians for many roles including patient care, teaching, research, and administration. These diverse roles require special knowledge and unique skills that can be learned but must be acquired in a relatively short period of time. In addition, discovery of new knowledge and development of high technology is proceeding at an incredible pace. Many drugs, procedures, and techniques that medical students will be using as physicians five to 10 years from now have not been discovered or developed at present. Thus, the educational process should prepare students to function and be comfortable in a rapidly changing environment and should provide them with the skills necessary to continue their education for a lifetime. The educational process should also nurture those attitudes considered important for those involved in the health professions. Given these conditions, what approaches appear best for medical educators? NUMS has identified four crucial problems:

The problem of curriculum coordination. Medical education is unique when compared to undergraduate college education in that courses and clerkships are seldom organized or taught by a single instructor. Exposure to a large and diverse faculty has distinct advantages but also creates many serious problems. Even with the best intentions, courses and clerkships may become fragmented resulting in courses losing their central thread and purpose. Much of the instruction then happens by chance rather than by planning. This experience becomes extremely frustrating to students. Mechanisms for coordinating instruction and learning experiences should be explored and developed. Questions involving the organization of instruction (topics, disciplines, organ systems, problems, or issues) should be addressed. Although some progress has been made in this area, few useful guiding principles have emerged. Perhaps information from the field of organizational behavior could be brought to bear on this problem.

The problem of information overload. Careful attention should be devoted to what can best be taught in a formal educational setting. Since it is impossible to teach everything, a mechanism or mechanisms should be developed to identify appropriate facts, concepts, principles, theories, processes, and procedures to be taught and emphasized. This identification or subject selection process could serve to reduce information overload and would support the notion of quality teaching rather than quantity teaching. More time would be available to address and think about critical problems and with planning, reinforcement could take place in a later phase. Another possible outcome would be a reduction in stress and anxiety for the student.

This summary was drawn from testimony prepared by Dr. Melton Golmon and presented by Dr. John Snarr in his absence at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

The problem of passive versus active learning. Much of medical education, especially in the basic sciences, makes extensive use of the lecture method with minimum student/teacher interaction. Although the lecture method appears to be an efficient method for teaching facts, the passive role assumed by students reduces stimulation and does not promote the development of the higher cognitive processes. Facts are forgotten quickly when there is no planned reinforcement (repetition, application, and synthesis). Learning activities centered around the application of knowledge to the solution of problems deserve more emphasis. This inquiry or problem-solving teaching strategy has application to both basic science and clinical problems and provides a model for approaching and thinking about problems. It provides students with an opportunity to integrate ideas, apply knowledge, make judgments, and draw reasonable conclusions. This critical skill must be developed and refined over time. The overall result is learning that is more useful, meaningful, and permanent.

The problem of the learning environment. Poor course coordination, information overload, passive learning roles, crowded schedules, lack of time, and the intensity of effort required to keep pace forces a large number of students into a "survival mode" of behavior. In this mode, the quality of learning is less important than knowing the mechanics of completing assignments and passing specific examinations. The real goal is somewhat negative and that is not to fail and as a result qualify for promotion. Although some evaluation systems including P-F and H-P-F grades have reduced student anxiety to some extent, "survival mode" characteristics remain because of conditions imposed on students. This learning environment is not optimal for developing attitudes that medical education is striving to nurture. Since attitudes are so important in all areas of medicine and are difficult to alter once developed, the creation of an appropriate learning environment should be given considerable attention and study. Perhaps a careful look at the humanities as well as incorporating more of the humanities into the curriculum should be involved.

MEDICAL COLLEGE OF OHIO

For Additional
Information, Contact: Howard S. Madigan, M.D.
Associate Dean for Continuing Medical Education
C.S. 10008
Toledo, OH 43699
(419) 381-4237

On the basis of the faculty response to the questions posed in relation to the assumptions in the AAMC booklet "Charges to Working Groups," the following concerns, issues, and problems evolved:

First, there are basic science concepts and principles that must be learned. This learning may be facilitated by didactic methods, complemented by judicious use of information management technology. The concepts and principles should be defined precisely while identifying relevant information that can be retrieved when it is needed. These efforts should be coordinated among the basic science disciplines, and to the extent possible, interdigitated with the clinical sciences. Reallocation of curriculum time should provide significantly greater opportunity for independent study, designed to stimulate students' thinking, in part, as a prelude to a problem-solving approach to clinical science studies.

Faculties must strive to identify and systematize essential basic concepts and principles within the biomedical sciences that are the foundation of clinical medicine for all physicians. While this basic science foundation is a prerequisite for study in the clinical sciences, there should be correlation and integration of the basic and clinical sciences throughout the medical school curriculum. The excessive memorization of facts required of medical students results from a generalized failure of medical educators to distinguish between acquisition of information and understanding.

While professing a desire for students to conceptualize the application of science and its principles, faculties and examiners offer tests that foster memorization and regurgitation of information. Long hours of lectures should be replaced by methods that stimulate self-directed learning and allow students to demonstrate their knowledge and understanding. This includes early encouragement of the problem-solving approach.

Second, in the realm of the clinical sciences, generally, there is no discrimination or differentiation between the clinical knowledge essential for all physicians and the knowledge required in preparation for specialty education. In effect, specialization begins in medical school as each clinical discipline defines its turf. There is little coordination or correlation among specialty and subspecialty groups resulting in unnecessary duplication and repetition, as well as fragmentation of the educational experience. Particularly in the major clinical disciplines, there is need for collaboration in designing and implementing the clinical curriculum to ensure that each graduate can acquire the essential knowledge and skills required of all physicians.

This summary was drawn from testimony presented by Dr. Howard Madigan at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

Students should be assisted and encouraged to pursue their inclinations and preferences in selecting elective clinical experiences with a view toward (1) learning more about a specialty or subspecialty that they may be considering as a future practice choice; and/or (2) gaining knowledge and experience in a discipline that they perceive as beneficial or necessary to their short-term or long-term progress and goals.

Emphasis should be placed on providing clinical faculty role models and/or increased opportunities for students to have clinical experience in different settings outside of the academic health science center or hospital, e.g., in physicians' offices, in group practices, in small communities as preceptees, in nursing and retirement homes. A corollary need is to identify community physicians who practice critically analytical medicine in their specialty and to enhance their role in teaching medical students. While residents can and should have an important part in clinical teaching, there is an overriding need to increase interactions between students and practicing physicians in the clinical years. Also, the clinical clerkships should be supplanted by the concept of clinical experiences and preceptorships to escape the prevailing task-oriented, low-person-on-the-totem-pole connotation of the clerk. Students must have appropriate and sufficient opportunities to study clinical problems in the context of a whole patient, to learn how to obtain, analyze, and utilize clinical and laboratory data to develop hypotheses and develop their decision-making skills.

Third, the traditional concentration of students' clinical experience in the acute care hospital severely limits their acquisition of essential knowledge in clinical skills, simultaneously providing a narrow perspective of the practice of medicine. Reluctance to deviate from this traditional mode is due to a combination of (1) insufficient clinical faculty who are motivated and willing to commit their time and effort; (2) too few community physicians adequately and properly prepared as clinical teachers, often despite their expressed interest and potential capabilities in this type of teaching; and (3) lack of specific institutionally standardized educational objectives for clinical experiences, with a consequent inadequate evaluation mechanism; thus, it is difficult to ensure reasonable uniformity of the end product.

There is a primary need to prepare medical school faculties for teaching--both full-time and volunteer faculty--to assist them in maintaining and improving their teaching skills, and to recognize teaching as a valued activity within the medical school, deserving of appropriate awards. Traditional opinion aside, neither the accomplished basic science investigator nor the expert clinician is ipso facto a competent teacher. Departments of medical education that are evolving must achieve greater acceptance, encouragement, and support from administration and, in particular, from faculty. Parallel need is to develop effective methods for initiating curriculum change and innovation within the medical school administrative and organizational structure.

OHIO STATE UNIVERSITY COLLEGE OF MEDICINE

For Additional
Information, Contact: Gregory L. Trzebiatowski, Ph.D.
Associate Dean for Medical and Graduate Education
370 West Ninth Avenue 228 MAC
Columbus, OH 43210
(614) 422-6437

The following were abstracted from the OSU statement prepared by the College of Medicine administrative staff in an attempt to identify some of the key issues they are addressing in ongoing faculty discussions.

It is increasingly unrealistic to expect students to master massive amounts of factual information. Concomitantly, it is inappropriate in the computer age to ask students to memorize and retain data that will be readily accessible via computers.

How can the "information overload" syndrome be controlled? This concern relates to the identification and transmittal of essential knowledge. OSU has been forced to identify essential knowledge because of its Independent Study Program (ISP), which about 35% of the student body use to pursue independent study of the preclinical sciences. The ISP, organized by body systems, consists of several modules that include instructional objectives, computer-based, self-examination exercises, and a written examination. To develop and update the instructional modules, the faculty has had to define the parameters for study within their disciplines. Furthermore, it is the general view of the College of Medicine that because of the knowledge explosion in the basic sciences and the resultant exponential expansion of clinical application information, faculty must work together in interdisciplinary groups to identify a manageable core of essential knowledge.

Another question the staff addressed is: What is the most effective means of training students in computer literacy? OSU faculty agreed that a series of integrated sessions on computer literacy should be offered to students in each of the four years.

That there is too much emphasis on knowledge transfer and insufficient opportunity for active learning and the development of problem-solving skills are also concerns. Because of these concerns, OSU's Med II Committee (which has responsibility for the second year) has been experimenting with various new teaching methods and has successfully reduced the amount of lecture teaching time by almost 40% in selected modules. These methods seek to maximize student involvement in the learning process and apply instructional strategies consistent with the type of learning and subject matter content to be mastered. Variety is also a factor in the selection of the instructional method (e.g., computer-assisted instruction, small group discussions, laboratories, independent study and independent research projects, and simulators and all types of audiovisual materials). Also, as a means of increasing problem-solving experience a one-month elective being offered this fall on an experimental basis will utilize the case-study approach as a mechanism for strengthening clinical-reasoning skills.

There will be particular emphasis in this course on the synthesis of multidisciplinary basic and clinical science knowledge. An approach that is being considered as a means of promoting problem-solving skills is to offer a "critical review of the literature" course that would focus on collecting, evaluating, and applying scientific knowledge about a particular clinical problem.

UNIVERSITY OF OTTAWA SCHOOL OF MEDICINE

For Additional
Information, Contact: Jean-Pierre DesGroseilliers, M.D.
Assistant Dean for Medical Education
451 Smythe Road
Ottawa, Ontario CANADA K1H 8M5
(613) 737-6502

A representative sample of faculty members particularly active in medical education, in conjunction with a Dean's committee, provided these insights in regard to institutional concerns at the University of Ottawa:

Integration of basic and clinical sciences. Comments by faculty suggest that learning in basic and clinical sciences should be carried out throughout the undergraduate curriculum under teachers of both categories working in collaboration. This is in striking contrast to the present Ottawa curriculum, in which students complete their basic science education before they enter a clinical clerkship, which provides no contact with teachers in the biomedical sciences.

Reduction of curriculum content. Faculty agree on the need to reduce the content of medical studies considered essential for the general professional education of the physician. There is unanimity in deploring that students are submerged by details and memorization of facts, that the amount of information taught during the preclinical phase is excessive, and that rotation through separate clerkships is inadequate to prepare students for their future profession. Paradoxically, faculty would like to see new subjects introduced into the undergraduate curriculum, thereby increasing the information overload unless a better selection is made of the subject matter in the traditional as well as the new disciplines.

Reliance on continuing self-education. While this medical school relies very heavily on formal lectures, faculty definitely support the concept of self-learning by the students. As a corollary, faculty insist that students be able to use computer technology.

Caring attitudes. The most unequivocal response of the faculty was to encourage the development of caring attitudes in future physicians. It recommends that preadmission requirements include nonscience subjects and behavioral sciences among admission prerequisites, that behavioral sciences be incorporated into the medical curriculum, and that role modeling become a major responsibility of all teachers in the school.

Strategies for change. The school has already started in the last few years to implement some of the changes suggested by faculty on the occasion of this project. The Faculty Council has already approved new institutional learning objectives for the medical school. The new objectives are based on the tasks of practicing physicians as determined by empirical research in their community as well as in other comparable centers. They were developed locally through a Delphi procedure. Under the authority of the Assistant Dean of Medical Education, all departments are now revising their own objectives accordingly. A major impediment will be the lack of experience of the faculty in developing and using objectives. The process will be coordinated by the Curriculum Committee, Phase II Subcommittee, which is concerned with the interface between preclinical and clinical sciences and deals with Special Pathology and Pathophysiology, has already started the process. The Preclinical Phase Subcommittee will follow suit as soon as they can relate their own objectives to those of the clinical phase. Application and review of the objectives, especially with regard to examinations, will be another concern of the school and will require continuing education of the faculty.

Faculty are determined to promote self-learning among the students and have increased the time devoted to elective studies in the curriculum from six to ten weeks.

The evaluation of students' performance is now being studied in detail in the clinical years and a major emphasis is being placed on evaluation of the affective domain. The AAMC publication, The Evaluation of Clerks: Perceptions of Clinical Faculty, is already being used by faculty members in the clinical years for that purpose.

MEDICAL COLLEGE OF PENNSYLVANIA

For Additional
Information, Contact: Gerald H. Escovitz, M.D.
Vice Dean
3300 Henry Avenue
Philadelphia, PA 19129
(215) 842-4102

Faculty and students of the Medical College of Pennsylvania discussed the problems and concerns stated in the AAMC Charges booklet.

1. Medical schools need to communicate to college premedical advisors the desirability of applicants with broad interests and educational experience indicating as well the minimum amount of science the applicant will need to be successful in medical school. There should be some limitation on the trend to early admissions programs because students need time to develop their interpersonal skills, to acquire living experience and to mature.

2. Very little attention is devoted to ensuring that teachers have some minimal training in teaching methodology. Medical schools must have a commitment to and investment in faculty development via in-house or CME programs if teaching effectiveness is to improve. An effective teacher is one who inspires self-directed learning. If we do not help students develop and perfect the ability to direct their own learning, they will be at a severe disadvantage throughout their professional careers and less helpful to their patients.

3. More formal attention must be paid to deficiencies that exist in curricula which hamper students' future development. These include skills in communication, problem-solving and logic. Other skills development areas are information retrieval and computer use. Integration of the last two areas would be desirable with convenient access to computers in the near future.

4. Preclinical courses are not well-integrated with the clinical experience. Preclinical and clinical faculty must interact more and share goals and objectives. There could be more use of joint appointments where faculty get more exposure to informational needs in other areas of the curriculum. The use of clinical correlations in preclinical courses and preclinical correlations in clinical courses would: a) improve the perception of relevance for the students; b) improve faculty interaction; c) provide greater continuity in training for the students. Although this latter idea is not new, implementation of this idea is difficult for schools where curricula are established and not easily subjected to major disruptions. In the past, most attempts at correlation and continuity have sought to put together multidisciplinary courses involving many clinicians and preclinical scientists along with the usual fight for curriculum time, usually in the junior year. The new approach proposed above requires minimal change in the curriculum but involves significant faculty interaction. No one is asked to give up anything and both students and faculty gain from the experience.

Another approach to this would be to involve fourth-year medical students, working with faculty in a task group, to provide feedback on the relevance of the information presented in the preclinical courses to their present clinical information needs. Another concern would be addressed by this approach in that MSIV would utilize communication and interpersonal skills in this setting with the faculty. Another suggestion was to pursue greater interaction between MSIV and MSI students to relate how the preclinical information is used in the clinical setting.

5. National Boards Part I is intended to test students' knowledge of preclinical sciences. Given the positioning of National Board exams at the end of the sophomore year of medical school, these act as a deterrent to spreading these courses out beyond this artificially imposed time frame. This is especially true in those schools that require passing National Boards for promotion to the junior year. But even in those schools without this requirement, the practical aspects are that National Boards are required eventually for licensure and the students find it advantageous to take them at the end of sophomore year. It is suggested that National Boards be redesigned to accomplish goals other than information recall (i.e., problem-solving, logical thinking) to enhance changes in instructional methodologies proposed above for preclinical teaching.

6. Skills felt important include interviewing, physical examination, interpretation of laboratory results, techniques of problem-solving (especially rational diagnostic reasoning), observational skills, library skills, teaching skills and communication skills, particularly the ability to communicate clearly with colleagues and patients at the appropriate level of content and sophistication. Means should be devised and implemented to sustain directed teaching in the fundamental skills of interviewing and physical examination beyond a traditional introductory course. In an optimal, well-conducted system, students should be observed performing these fundamental skills and provided with continuing feedback from faculty throughout their required rotations and electives. Competence in these skills should be certified by faculty prior to graduation.

7. Recommendations were made that might help to enhance the personal qualities, values and attitudes of the physician. Courses included in the preclinical years that touch more on human values (i.e., geriatrics, oncology, nutritin, bioethics and human sexuality) should be given increased importance. An educational process which would help the emerging physician integrate a set of personal values would emphasize the development of thought processes, concept learning and problem-solving techniques. In the pre-clinical years this development could be enhanced through a continuous, properly supervised ambulatory clinic experience; in the clinical years through multidisciplinary case discussions which would bring together a variety of contributions including basic scientists, social and behavioral scientists, clinicians and members of other disciplines where appropriate. The over-arching framework for this development of judgment and values would primarily be provided by attending physicians, who can serve as role models; as teachers relating to students, as physicians relating to patients - treating all with dignity, respect and compassion.

PENNSYLVANIA STATE UNIVERSITY COLLEGE OF MEDICINE

For Additional
Information, Contact: Eugene A. Davidson, Ph.D.
Associate Dean for Education
P.O. Box 850
Hershey, PA 17033
(717) 534-8586

Penn State faculty and students, through the Curriculum Committee, provided a response to GPEP topics that had relevance to their own curricular concerns or that were of sufficiently broad interest to warrant extended review. The following are from either group or personal viewpoints expressed.

In the discussions a constant theme involved the threat of information overload and the primary role of the faculty in screening and organizing the information to be mastered. Specific issues addressed included the following.

1. The need to emphasize clinical correlations during the basic science years. Case presentations and/or exposure to patients should involve the integration of several disciplines. Conversely, an emphasis on basic sciences in the clinical years would also reinforce biomedical science knowledge. A pool of basic science faculty should be identified who can serve as "attending scientists" much as senior clinicians assume clinical responsibility. These individuals should attend rounds and clinical conferences to provide fundamental topical reinforcement within the clinical setting. Some clinical exposure concurrent with basic science courses might help students know what it is they should focus on in basic science courses. Preceptorships could be a mechanism to achieve this goal.

2. The development of computer technology in teaching and self-education deserves great emphasis because it provides a new dimension in skill maintenance and data acquisition for most physicians.

3. Disciplinary clerkships should have at least four weeks and not more than 12 weeks. Some 12-week rotations probably could be reduced. Family medicine and emergency medicine clerkships might be added as required rotations. Family medicine emerges as a model of ambulatory medicine, preventive care, and health promotion not demonstrable to the same degree on other clerkships.

4. Students' learning of essential knowledge during clerkship rotations could benefit from attention to several areas: (a) the nature of the patient/physician (student) interaction; (b) the nature of medical problem-solving behavior in the student; (c) the ways to educate students to be teachers of peers and patients; (d) the ways of allowing students to observe teaching faculty perform their actual role as physicians in physician/patient interactions; and (e) the ways to evaluate the learning of knowledge and skills during each clerkship.

5. Study habits least likely to be adaptable to the development of independent learning skills are (a) memorization of lecture material to prepare for testing at the level of recall; and (b) studying to pass or do well on a test (including National Boards).

PENN STATE PAGE TWO

To facilitate students' development of skill in independent learning, several suggestions were made:

1. Emphasize from the second year on, the role of the patient as the prime motivator of learning. The desire to correctly diagnose a patient's disorder, and appropriately treat the patient, should become the force behind a physician's study.

2. Clinical faculty members can discuss with students how they manage to continue to learn.

3. Use more small group meetings requiring preclass preparation and participation by the student.

4. Supervised teaching by the student, perhaps in the form of student conference.

UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE

For Additional
Information, Contact: Fredric D. Burg, M.D.
Associate Dean for Academic Programs
36th and Hamilton Walk Suite 100 MEB
Philadelphia, PA 19104
(215) 898-8034

The University of Pennsylvania School of Medicine completed in 1982 a two-year self-appraisal of its program in medical education. As a result, the school endorsed the following goals for its program in medical education.

Skills and Abilities Expected of its Graduates. Assure that all graduates have the knowledge, skills, and abilities requisite for postmedical school professional development; produce physicians with an understanding of basic and clinical sciences that permits them to proceed towards excellence in their chosen careers; and provide a learning environment that enhances knowledge of the sociological, cultural, and economic aspects of medicine and that promotes the ability and desire to establish caring, empathetic relationships with patients.

Content of the Medical School Experience. Provide a required core learning experience that ensures the mastery of the above knowledge, skills, and abilities; and provide significant elective time, so that students can formulate a personal curriculum reflective of their career goals and that facilitates use of the resources of the School of Medicine and the University of Pennsylvania.

Process of Learning for its Students. Provide an academic atmosphere that emphasizes principles, independent thinking, and problem solving, rather than one that exclusively saturates the student with factual information; and provide opportunities for medical school faculty to develop improved skills directed toward the education of the general physician in curriculum planning, instructional design, and evaluation of student achievement and course quality.

The program of the School of Medicine is designed to meet these goals in the following way:

The enhanced curriculum is divided into three stages: Stage I the ten-month first year emphasizing basic science; Stage II the first six months of the second year emphasizing the pathophysiology of disease and introduction to Clinical Medicine; and Stage III the remainder of the curriculum emphasizing clinical medicine.

The function of Stage I is to provide the student with much of the vocabulary and habits of thought of medical science and a core of facts and principles in the basic sciences upon which to build. Emphasis is on normal form and function, but a start is made towards assisting students in learning about the effect of disease processes on the human. Stage I also lays the groundwork for learning how to interact with patients by including history taking, physical examination, and some teaching of physical diagnosis.

The function of Stage II is to convey a body of knowledge of disease, with emphasis on pathophysiology, and to prepare the student for clinical experiences by additional programs to aid the student in learning physical diagnosis, as well as introductory learning experiences in radiology and laboratory medicine. Learning is facilitated by presentation of problems by organ systems.

The function of Stage III is primarily to provide the student with a broad base of clinical experience from which the student will achieve sufficient skill in diagnosis and patient management to be prepared for house officer training in any of the medical specialties. New programs utilizing seminars and mini-courses are proposed to be included in Stage III: (1) to help the student become knowledgeable in the psychosocial and behavioral aspects of medicine; (2) to reinforce the student's knowledge of basic science; and (3) to reinforce an attitude favorable to later continuing self-education.

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE

For Additional
Information, Contact: Robert E. Olson, M.D., Ph.D.
Associate Dean for Academic Affairs
3550 Terrace Street
Pittsburgh, PA 15261
(412) 624-0873

Active involvement of students and faculty in many meetings and an all-day workshop of 28 students and 35 faculty and administrators in 1982-83 preceded the preparation of the draft presented to the chairman of the Curriculum Committee and the Associate Dean for Academic Affairs, from which these observations are drawn:

1. The explosion of scientific and medical knowledge has made careful curriculum planning a continuing necessity. It is essential that students acquire a solid data base in biological sciences prior to clinical study. Reinforcement of basic science concepts and knowledge in the clinical years can be enhanced by establishing effective communication between basic science and clinical faculties. This may be implemented by having on the clinical faculty physician/scientists who will emphasize the importance of biomedical science for the student in case presentations, as well as having basic scientists with clinical backgrounds, and clinicians who have input into the first-year curriculum. Specific means of assimilation of medical knowledge throughout the medical school years include joint participation in clinical conferences and in journal clubs, and inclusion of pathophysiologic mechanisms in courses and examinations, graduate as well as undergraduate.

2. Premedical and medical study should provide students adequate skills for collecting and interpreting clinical data, solving problems, and analyzing medical information. Medical education should include a strong emphasis on basic skills of clinical data collection, data interpretation, hypothesis generation, and hypothesis testing. Both the "thinking" and "doing" skills are closely related to essential knowledge and, consequently, should be included in the objectives of all basic science and clinical course material. Students should begin to develop skills in critical reading, quantitative analytic reasoning, and problem solving during college. Students in medical school should develop the ability to analyze and interpret medical literature. Basic science teaching should emphasize concepts and logical thinking. Physicians and medical students should have increasing access to electronic data retrieval systems.

3. The ability to teach ambulatory patient diagnosis and management is limited. The fundamental skills in the general professional education of the physician include general skills involved in patient diagnosis and management. Most medical school clerkships do not provide sufficient time for meaningful experiences in longitudinal care, since it is unusual for a student to see any given patient with a chronic illness more than once or twice during a rotation in ambulatory medicine. In general, this experience is best provided during the residency.

4. Preventive care is not usually integrated in medical education. Preventive care instruction should be integrated throughout clinical education. The value of preventive care in reducing health costs should be emphasized.

5. Premedical and medical curricula may inhibit the development of personal qualities, values, and attitudes desirable in physicians. A closer interaction between students and faculty members may be achieved by institution of an adviser system in which a small number of students have the opportunity to interact informally with a member of the faculty to discuss stress management and explore methods for increasing student and faculty productivity. Various teaching methods should be utilized to avoid the deadening of student curiosity that may result from long hours of lectures.

Student-oriented activities, designated time on/off periods, and support groups also foster personal development and relieve stress. A school honor code encourages integrity and trust. Faculty and student cultural and ethnic diversity facilitates the comfort with "differentness" so vital to good patient care.

UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE

For Additional
Information, Contact: Jules Cohen, M.D.
Senior Associate Dean for Medical Education
601 Elmwood Avenue
Rochester, NY 14642
(716) 275-3407

Introductory comments to this report follow: "We subscribe to the principle that there is no single unambiguously ideal methodology or program for educating physicians. Each institution needs to develop for itself, and continuously reshape, its objectives and programs ..."

Faculty comments include the following:

1. The essential base of knowledge from undergraduate science courses will always be difficult to define, and it will vary over time. Most important are a broad understanding of the language and methodology of science and an appreciation of basic principles in each of the major scientific areas. Breadth of undergraduate preparation is essential.

2. One of the most important needs of medical education is for more exchange of ideas among medical school graduates, clinical faculty, and basic science faculty to facilitate broad agreement about what basic knowledge may be essential to the education of the physician.

3. Basic science study should both precede, and be interwoven into, clinical study across all four years of the medical school curriculum. Exposure to the basic sciences without reference to case study yields less engagement with and incomplete appreciation of these sciences.

4. Rochester believes strongly in the broadest possible clinical education of its medical students. The emphasis is on patient-centered clinical education, acquisition of basic clinical skills, and understanding of pathophysiology, and highly developed reasoning ability. In achieving these objectives, students should have experiences in all of the classical major disciplines. Beyond basic exposure, some mix of required and elective work is desirable. Rochester expressed concern about the quality of the fourth year and believes that some return to externship/subinternship experiences is important to students' development--both in knowledge and clinical skill and in developing responsibility for patient care.

5. A broad clinical education is incomplete without adequate experience in the care of ambulatory patients, and in the care of the elderly and chronically ill.

RUSH MEDICAL COLLEGE

For Additional
Information, Contact: Gerald S. Gotterer, M.D., Ph.D.
Associate Dean for Medical Student Programs
600 South Paulina Street
Chicago, IL 60612
(312) 942-6913

Rush Medical College has undertaken three activities designed to redress some of the problems on which GPEP has focused:

1. To learn more about what happens to medical students, Rush launched a longitudinal study of the entering class of fall 1982 (96% of the students participated voluntarily). Assessments will be demographic, psychological, psychiatric, with sociological factors on personal, educational, and professional outcomes. This study provides an opportunity to explore relationships among a variety of cognitive skills, personality traits, and social network variables. It will also facilitate modifications of programs and introduction of preventive measures to enhance the ability of students to perform to their full potential. Career choice aspects should be relevant to planning for health manpower needs.

2. In 1979 Rush instituted its academic adviser program in which cohorts of four carefully selected faculty volunteers contract to provide counseling to the students in each class. Each counsels 25-30 students for the full duration of attendance at Rush. Advisers receive intensive training, and the program continues to undergo evaluation and development. The program was developed with the underlying belief that the atmosphere governing the student's educational experience will influence the student's ultimate attitudes and behaviors with patients and enhance the prospects that they will become humane and compassionate physicians.

3. Rush has initated planning for an alternative, experimental preclinical curriculum for groups of 32 students, to be implemented in September of 1984. The program is based on independent, small group study and is problem-assisted. The Rush program will pay explicit attention to developing clinical reasoning and interpersonal skills. Student progress into the clinical years will require successful passage of criterion referenced certifying examinations. Basic science faculty will identify learning objectives and examinations and will serve as resource individuals in a consultative rather than a lecturing format. The learning of the preclinical disciplines will be enhanced by concurrent exposure to clinical problems that will be analyzed in small groups led by specially trained general physicians. The small group problem solving sessions will have clinical reasoning and doctor/patient interactive skills as explicit learning objectives. The program will also incorporate the use of computer technology as an aid to information storage and retrieval and problem solving. The program is based on the premise that most students can learn a great deal on their own. It shifts the objectives of the student/faculty contact from that of the transfer of specific information to instruction in skills--clinical reasoning and interpersonal.

SAINT LOUIS UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Alberto Galofré, M.D.
Assistant Dean for Curriculum
1402 South Grand Blvd. Room 226
St. Louis, MO 63104
(314) 664-9800 x622

Kevin O'Rourke, OP, provided a copy of a working paper prepared for a retreat on "Values in Medicine." He begins by defining a value as "an acquired power (idea, belief, attitude, disposition) that actually influences and shapes human behavior." After discussing values in general, he ascribes values specific to a physician as follows: they arise from role in life and relationships. The main values for a physician are realistic self-esteem (courage tempered with humility) and justice toward family, patients, colleagues, and society. These values should be expressed as particularly (behaviorally) as possible in order to avoid vague statements and pious thoughts. Thus it is not enough to say that a physician must develop self-esteem, respect the rights of patients, or be honest and compassionate. Rather, the specific objective behavior that manifests these values is also described.

Fr. O'Rourke believes an ethical physician will be considerate of personal needs and respect the rights of spouse and children (if married): use food and drink in moderation; spend adequate time with family in cultural, religious, and recreational activities; avoid excessive emotional and physical fatigue; spend time in meditation; help family members develop as individuals, not as though they were part of medical profession; develop decision making; and seek to support family generously with no desire to accumulate wealth.

Also, an ethical physician will fulfill responsibilites arising from role as physician: demonstrate knowledge, skills, patience to make accurate diagnosis and proper prognosis; read journals significant for medical practice or research, thus keeping up to date in knowledge and skill; know the principles of medical ethics and be able to consider ethical issues systematically (i.e., not mere personal option); never reveal confidential information about patients or colleagues; realize limitations of medicine and own knowledge and skills, affirming that nature heals, physicians dispose; and be willing to sacrifice for patient, but keep other responsibilities (i.e., family life) in balance.

An ethical physician also will repect the rights of patients: listen carefully to the patient, allow him to express concerns, and be willing "to waste time" with the patient; inform patient fully concerning diagnosis, recommend treatment, and explain risks and benefits of treatment; avoid paternalism allowing patient to make decisions concerning treatment insofar as possible; be concerned with overall well-being of patient, not only physiological function; consult with family when necessary, especially if the patient is unable to decide; do charity care if patient is unable to pay; within ethical norms, allow patient to die rather than prolong life without reason; and explain when patient must wait for the physician and help dispel the anger that might result.

Also, an ethical physician will respect the rights of colleagues: work cooperatively with other health care professionals, communicate doubts and difficulties with other medical team members, and not cover up inadequacies; solicit and accept suggestions from colleagues gracefully, appear on time for meetings, notify if delayed, and express opinion gracefully but clearly; not split fees; and make report concerning negligence or malpractice to proper authorities, if personal discussion fails.

SOUTHERN ILLINOIS UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Howard Barrows, M.D.
Associate Dean for Educational Affairs
Post Office Box 3926
Springfield, IL 62708
(217) 782-7932

The Southern Illinois University School of Medicine faculty held a number of broad discussions regarding philosophies and approaches to medical education and college preparation for medicine. Their conclusions and recommendations were summarized around a number of principles:

Principle 1. Acquisition of essential knowledge and skills and appropriate attitudes is a prerequisite for the effective practice of medicine. The most important set of skills physicians must possess are those that allow them to organize their knowledge, reasoning powers (problem solving and decision making), and "technical" abilities (e.g., interview, physical examination, use of instruments, prescription writing, information seeking, etc.) to evaluate, understand, and manage the problems of patients in an effective and efficient manner. This ability includes weighing all decisions in the light of ethical, moral, judicial, and economic considerations and knowledge of appropriate basic science concepts.

Recommendations include the following:

a. Frequent and early opportunities to practice dealing with actual patient problems followed by opportunities to reflect on one's own performance in the light of information provided by others are needed to teach essential knowledge and skills and to aid in merging these elements into an effective professional approach to patients and their problems.

b. Memorization of content should not be the skill most valued and rewarded in the curriculum--rather students' ability to use information and skills in understanding and managing a patient's problem(s) should be valued.

c. The learning of essential knowledge and skills should be carried out in the context of solving clinical problems whenever possible throughout undergraduate medical education including the preclinical years.

d. Assessment of students should emphasize the appropriate use of information and skills.

e. Instruction in the humanities should be integrated into the curriculum in preclinical and clinical years.

Principle 2. The practice of medicine is dynamic and knowledge about biomedical sciences and health care practice is continuously growing. Therefore, the student must develop and refine skills of self-evaluation and self-directed learning.

Recommendations include the following:

a. Students should develop the capacity to monitor their own abilities to evaluate and care for their patients.

b. Since no one can anticipate all future directions biomedical science and health care will take in coming decades, and what future problems or needs a particular student will face, medical studnts must become physicians who keep their skills and knowledge contemporary.

c. Faculty need to anticipate trends and directions in their area of expertise and to use this knowledge to assist students in their learning.

Principle 3. In being responsible for the curriculum, faculty act both as sources of knowledge and organizers of the learning experience. Thus, they must bring to the curriculum both a depth of knowledge in their field and the leadership talents essential to manage effective learning experiences.

Recommendations include the following:

a. Students should be aware of learning objectives in advance so they can make the most of available learning experiences.

b. Student evaluations should be used primarily to diagnose student acquisition and ability to use essential knowledge and skills.

c. Useful knowledge is the result of action followed by reflection. Students must be given the opportunity to practice their skills followed by an opportunity to learn from others who have observed their performance or by observing the performance of others in a similar situation.

Principle 4. Students should be allowed the time necessary to gain fundamental skills and knowledge. Instruction should be organized around mastery rather than time. Evaluation activities should be primarily designed and used to assist students in determining progress in learning and diagnosing the nature of learning difficulties.

Recommendations include the following:

a. Faculty should realize that skills improve with practice and feedback.

b. Within limits there should be no penalty imposed on those students who require extra time and practice to demonstrate proficiency.

c. For promotion purposes, student performance should be evaluated against preset acceptable levels of performance rather than the performance of other students. All such decisions are ultimately a matter of judgment based on thorough knowledge of the student's performance and circumstances.

STANFORD UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Carolyn Lougee
Associate Dean for Undergraduate Programs
M105 Stanford Medical Center
Stanford, CA 94305
(415) 497-3329/9787

Stanford's dean arranged a symposium on education that drew about 200 students, faculty, house officers, and community physicians. Plans were that one panel would discuss promoting a broad baccalaureate education, essential biomedical science knowledge, and teaching essential concepts; however, because of time constraints and interest in the first subject, the latter two topics could not be addressed. Dr. Saul Rosenberg told those assembled of his extensive studies of Stanford premedical students. He presented data to show that premedical students at Stanford are seen by themselves and by their peers as "narrow, aggressive, competitive, anxiety-ridden, unfriendly, and dishonest individuals." Most of the people there felt that those traits were developed to fulfill requirements for admission to medical school. The long-term consequence of this behavior was one major area of concern. The sense of the discussion was that no particular college course, or area of concentration, or a simple change in the MCAT emphasis, would correct this so-called "premed syndrome," but rather that major changes in the undergraduate teaching and learning process and in the medical school admissions process would probably be required.

The second panel addressed skills in computer technology and decision analysis. Strong recommendations were advanced for including training in computer science in the curriculum. It was perceived that such skills are and will be needed for the purposes of research, information management, and direct patient care. A number of people, mostly seasoned clinicians, were skeptical about the latter point and were troubled by a potential negative effect of computers on direct patient care and computers as teachers as well. It is much more difficult to interact with a computer than with a teacher. However, Stanford is starting to move ahead in this area and has recently established a medical information science program that grants an M.S. or a Ph.D. degree and provides sabbatical experience to physicians. The chairman of the program is from the department of medicine and faculty are from computer science, engineering, statistics, psychology, and education.

The third panel discussed personal qualities, values, and attitudes. Here discussions centered largely around the need for role models, the need to draw out by example the humanistic qualities of the students, and the nature of the working partnership formed by a physician and patient in a professional relationship. The stresses of medical school were discussed at some length (between 30 to 40% of Stanford's medical students at some point in their careers sought psychiatric counselling), including overt and covert sexism, racism, and coping with demands coming from all directions at one time. A very active Stanford group, formed two or three years ago and called the Committee on Well Being of Medical Students, addressed these issues quite vigorously. The group is directed by the faculty. They have developed an elective course entitled The Human Cost of Medical

---

This summary was drawn from testimony presented by Dr. Robert Cutler at the AAMC Western Regional Hearings held January 27-28, 1983.

Education, first introduced last year.

Another major area of concern at Stanford is a desire among most of the faculty to recreate a curriculum at Stanford. The curriculum at Stanford since 1968 has been entirely elective with no required courses, except for a few basic clinical clerkships. Students need to obtain a certain number of units and to pass the National Boards. This was started in 1968 to create the true graduate mode of education.

For the last year and a half the Curriculum Committee has been charged with defining the elements of the basic science curriculum. This has led to an extraordinary number of discussions with basic science faculty persons, some of whom never seem to have talked to each other before. Some people interested in teaching about DNA at Stanford were not aware that what they taught was also taught in another course the following year, almost verbatim, sometimes even by the same lecturer. These discussions have been extremely helpful, and will permit the committee to propose an order to the curriculum that will bring these departments together in a more interdisciplinary manner. Stanford has a stated mission of teaching students to prepare themselves for careers in academic medicine, including research, which is emphasized at Stanford.

Dr. Cutler presented a few ideas from their attempts to solve some of the problems in medical education:

1. A mechanism by which the colleges in some totally honest way can apprise the medical schools of their best candidates for medical school is needed.

2. A way needs to be found of reducing the numbers of applicants to each medical school.

3. Laboratories and other kinds of interactive sessions, in which one develops a relationship with the teacher, rather than the material that he is teaching, should be increased.

4. Bona fide curricular opportunities for the summer quarter need to be offered in medical school.

5. The myth that there are two kinds of doctors, one scientific and one humanistic, should be dispelled.

6. Medical schools should strengthen their commitment to advising and strengthen the advisory system.

7. The fourth year in medical school should be made a productive educational experience.

8. Medical students should be regarded as graduate students, but they should not be expected to be able to function the same way a graduate student in a single discipline would.

STRITCH SCHOOL OF MEDICINE

For Additional
Information, Contact: Roland R. Cross, M.D.
Associate Dean for Admissions
2160 South First Avenue
Maywood, IL 60153
(312) 531-3229

In response to the AAMC "Charges" booklet, Loyola University Stritch School of Medicine held several public sessions to which members of the university, faculty, staff, and student body were invited. During these sessions, issues of concern were identified, discussed, and prioritized. These issues included the following:

Learning Facts Versus Learning Skills. An emphasis on skills rather than on facts will permit the aspiring physician to deal with fields of knowledge that are unknown today. Yet, those who participated in the discussion of this issue still seemed to think that, like it or not, a certain basis of factual information is necessary.

Passive Versus Active, Independent Learning. Opportunities for experience in laboratories, problem-solving, and "personal doing" should be increased.

Curricular Revision and Biomedical Advances. The problems and knowledge in biomedical science have changed and grown enormously, but the educational process in medical school has remained the same for years. New courses and different allocations of time to each discipline are needed.

Role Models. Role models are important in medical school. Teachers who exemplify the traits of educated, empathetic physicians are needed to encourage and demonstrate a broader approach to medical education and practice. They are important for attaining and for nourishing personal values and attitudes in the students.

Admissions Criteria. Individuality among students is important. It is very important to seek applicants with different perspectives; it is not necessary to seek a group of "ideal" students who fulfill a certain list of requirements.

Clinical Practice. Seeking a balance between the personal needs and views of the physician and the welfare of the patient should be addressed in medical education. Various scenarios that may occur in clinical practice need to be discussed. Future practitioners need to be prepared for the stresses their careers may bring to their personal situations.

Competition. "Unhealthy" competition--that which is based on an individual's seeing himself as number one in comparison with other people and wanting to stay that way--is self-defeating and should not be fostered in medical education. "Healthy" competition--that which is based on striving for excellence, cooperation, etc.--is good and necessary. The motivation underlying the spirit of competition is what is important. Medical education should ensure proper motivation.

TEXAS TECH UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: E. Jay Wheeler, M.D., Ph.D.
Executive Associate Dean
3601 Fourth Street
Lubbock, TX 79430
(806) 743-3005

A steering committee for the GPEP project circulated questionnaires to basic science faculty, clinical science faculty, students, and recent graduates concerning GPEP issues selected from the "Charges to Working Groups." The five major issues that follow were selected through an analysis of the questionnaires by the steering committee. These issues will be examined in depth by subcommittees appointed by the Dean and recommendations will be made to the Dean by November 1, 1983. A second phase of the GPEP study will then be convened and will conduct a focused review of the curriculum. Curriculum change will be instituted as needed to act on the findings, within the mission and resources of the school of medicine.

The electives program and the senior year. A major concern of the faculty at each of the four campuses is the quality of elective experiences taken outside the TTUHSC system. The faculty also believes that a more detailed description of the content, scheduled experiences and learning expected in each of the TTUHSC regional centers is needed. This was echoed by the alumni, who felt that the diversity of experience thus gained was of value to them. The role and degree of involvement of faculty advisers is unclear. Specific data are needed to define the numbers and types of such off-campus activities, and the extent of the problem. Further analysis is necessary to delineate the components of the problem and arrive at possible solutions. Another consideration is the question of whether the school should require certain "selectives" in the senior year, which it currently does not do. The lack of such requirements has led to the perception of compression of the curriculum within the first three years.

Pathophysiology and physical diagnosis. Students and alumni are particularly critical of the compression of the current physical diagnosis course in the latter part of the second year and of the lack of an organized course in pathophysiology. The problems related to these two activities lead to a feeling that valuable clinical input is deleted from the preclinical years.

Redefinition of essential information provided by basic science departments. All of the groups surveyed cited heavy curricular demands in the first two years. Areas of questionable relevance and voids were pointed out. There was a general plea for a more clinical emphasis in basic science material and for review of the amounts of time devoted to the various courses.

Identification of voids in the curriculum. The alumni, in particular, felt weak in certain areas. Most of these are interdepartmental in nature, such as nutrition, medical ethics, and critical analysis of the current literature.

Undergraduate preparation for medical school. All of the groups surveyed indicated a strong need to require or emphasize areas in the arts and sciences and in human relations skills during the undergraduate preparation for medical school.

Members of the steering committee for the GPEP Project believe that their current study will have its most important outcome in the retooling of the curriculum of a relatively new school. Such a study has not been done in a comprehensive manner as yet in their institution.

UNIVERSITY OF TEXAS, GALVESTON, MEDICAL SCHOOL

For Additional
Information, Contact: Julian I. Kitay, M.D.
Associate Dean for Curricular Affairs
528 Administration Building
Galveston, TX 77550
(409) 761-4778

Seven broad issues from the GPEP document were identified, questions were formulated around each, and one-hour interviews were held with 13 chairmen and 24 faculty members in clinical departments; seven chairmen and 21 faculty members in basic science departments; three senior students; and two students each from years one, two, and three. The results of the survey will be germane to an institutional plan to undertake curricular and instructional changes. Some ideas gleaned from the respondents' discussions follow.

Question 1: What process do you now use to determine basic science knowledge needed to graduate from medical school? Are you satisfied? What alternatives do you recommend?

Most respondents' perspectives on this issue are defined by and limited to their respective disciplines. Content is decided at the course level; external guidance comes from Part I of the National Boards; and individuals contribute specifics with informal departmental consensus. The departmental consensus strategy is more often employed in interdisciplinary courses, however. Clinical correlations are used to demonstrate relevance of the basic science material to medicine and to motivate students.

Basic science faculty and chairmen are comfortable with this arrangement by and large, while clinical chairmen and faculty are generally not satisfied. Both clinicians and basic scientists agree that two-way interaction between their groups is appropriate and should be fostered.

Question 2: How can our faculty encourage students to conceptualize the application of scientific principles and discourage excessive memorization of facts?

Faculty agree that there is an emphasis on memorization of facts rather than conceptualization and application. The educational schedule allows neither faculty nor students enough time to focus on concepts.

Basic science faculty seemed to feel that memorization is both necessary and appropriate. They suggested tutorial/small group experiences as ways to help students achieve conceptual understanding and advocated the use of essay/short answer tests for assessment. Clinicians, on the other hand, often asserted that study of basic science from a clinical perspective gives students a conceptual framework upon which to rely both for retention of information and clinical problem solving. Students said they find it helpful to be asked to apply the basic science knowledge in a clinical context.

Question 3: How do we differentiate the clinical knowledge and skills essential for all physicians from the knowledge and skills needed by specialists?

The third year should be observational in nature, on the exposure level for students; the residency is for the acquisition and practice of specialized skills. Students should become aware of the common medical problems and how to manage these; the rarer, more difficult, should be left to residents.

Question 4: Should all physicians be skilled in identifying and applying measures to prevent disease and promote health? How do students learn these skills? Are there other approaches we might use? If so, what?

Generally faculty called for role modeling to emphasize the importance of preventive medicine, but they also saw difficulty with providing significant modeling in a tertiary, episodic care institution where the emphasis is on illness rather than wellness. Many clinicians pointed out, too, that there is little glamour or excitement associated with preventive medicine, and there are financial disincentives to its practice.

Question 5: What is your view concerning the development of skills in our students for assessing medical literature analytically and critically? What approaches inhibit? What approaches facilitate?

There was agreement that graduates need these skills and that students usually do not possess them unless they have had some experience with research. Several faculty and some students called for increased used of original research material as opposed to the relatively derivative tests and syllabi, but many believed such an approach would be both unworkable and unpopular due to time constraints.

Question 6: In the future, physicians will have sophisticated electronic data retrieval systems, computer-based, decision-making assistance, and advanced telecommunications technology at their disposal. What is your view about preparing students to use these technologies effectively later in their careers?

Many clinical faculty expressed reservations about their own level of skills with them, but computers were seen as powerful teaching tools.

Question 7: Should we help our students develop skills which promote independent learning? What approaches facilitate? What educational approaches interfere with this goal?

Helping students to develop independent learning skills and making them "open" to new ideas and inquiry were almost universally accepted as goals for medical educators; likewise there was almost universal agreement that the present curriculum does not facilitate their accomplishment due to class size, compactness of the curriculum, the net effect of syllabi, programmed instruction, rote memory examinations, etc., and disinterested or ill-prepared faculty. Faculty reported that small group teaching with opportunities for problem-solving, literature review, and research would be helpful. They also advocated more student time be allowed in the curriculum for student research and urged less use of multiple-choice tests in favor of essays, papers, and oral exams.

UNIVERSITY OF TEXAS, HOUSTON, MEDICAL SCHOOL

For Additional
Information, Contact: John C. Ribble, M.D.
Associate Dean for Academic Affairs
P.O. Box 20708
Houston, TX 77025
(713) 792-5000

UTHMS curricular affairs are affected by the administrative evolution of their institution and the rapid growth of both faculty and students. The initial small group of faculty was closely knit personally, professionally, and philosophically. They effected a systems biology curriculum and a more loosely operant clinical curriculum; instruction extended over three years. Curricular management was achieved by a committee of the whole; no formal mechanisms for accountability and coordination were needed.

A curricular transition period occurred secondary to the rapid increase in students and faculty. Informal communications were incapacitated by the large numbers of people. Also the academic timetable was revised by adopting a four-year curriculum. Attempts were made to salvage the previously effective systems biology curriculum. These attempts brought together key groups and individuals with commitments to effectively meet institutional educational goals. Thus, when faculty consensus was reached to adopt a department/discipline oriented curriculum, these key groups and individuals quickly addressed the new strategy and devised means for rapid implementation.

Key faculty members evolved curricular governance mechanisms that enabled them to recognize and forced them to address major issues. The process they used was the most valuable lesson of the whole experience because by it they have achieved not only a problem-solving mode but a problem recognition capacity that leads to long-range planning. The key elements of the process were (1) identifying interest groups and individuals; (2) bringing those identified together; (3) taking the time to communicate, compromise, collaborate, and reach consensus on goals, purposes, and objectives; (4) generating and codifying operating procedures; (5) implementing these procedures; (6) evaluating the procedures; (7) evaluating the effects on individual faculty and students, on the courses, on the departments, and on the curriculum; and (8) modifying the procedures to meet the needs.

A general consensus on a curriculum, as opposed to a montage of courses, has begun to arise. Fundamental requirements for quality educational offerings have been identified and incorporated by faculty: an overall plan of curricular governance, a Curriculum Implementation and Monitoring Plan (CIMP); experience proved it was more amenable to the basic sciences. They evolved and began to implement a CIMP for the third year (mandatory clinical rotations) and have begun to devise a CIMP for the fourth year (elective rotations). Firm and fair-handed application of the CIMP occurred because the plan arose by consensus, because those who generated the plan had done so without vested interest in a particular solution, and because there was no fear of addressing

---

This summary was drawn from testimony presented by Dr. Waldemar Schmidt at the AAMC Southern Regional Hearings held February 24-25, 1983.

sensitive topics or of failure. The BS-CIMP revealed the need for preliminary preparation (outlines, objectives, grading criteria, etc.), for clearly defined evaluative mechanisms and for response to the feedback from students and faculty. The Curriculum and Educational Policy Committees documented what was really occurring in the curriculum; the data recorded raised other issues to be addressed. These "spin-off" issues included (1) reexamination of the school's grading policy; (2) a curriculum flexibility policy that favors the educationally disadvantaged student; (3) a remediation policy governing failures in basic science courses; (4) the use of external examinations; (5) maximum daily class hour load guidelines; and (6) the coordination of educational efforts with the Office of Student Affairs, and especially the Student Evaluation and Promotion Committee.

They have begun to collect data on the mandatory rotations and to define their goals, purposes, and objectives for the fourth year; upon completion, they will devise a curricular management system for the fourth year. The third year and elective year CIMPs will generate comparable spin-offs as those seen in the basic science years. The clear definition of mandatory and elective rotation goals will allow them to consider managing the students' clinical science experience; until then, the clinical sciences will continue to be a "black box" system.

This process addresses complex issues with wide representation and ownership and from that setting generates specific policies and procedures for implementation. It leads to examination of course/rotation/elective content and balance and to a responsive curriculum rather than an educational melange. They view the medical curriculum as a continuum: premedical studies, the medical school experience, residency training, and continuing medical education. Their experience reveals five fundamental activities that must be addressed in creating or evaluating such a curriculum: (1) curricular content and range; (2) curricular operating mechanisms; (3) balance within each subject; (4) coordination of subjects to create a curriculum; and (5) educational processes employed and their effectiveness.

TUFTS UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Joel D. Feinblatt, Ph.D.
Associate Dean for Curricular and Basic Science Affairs
136 Harrison Avenue
Boston, MA 02111
(617) 956-6934

A Task Force on Curriculum Planning was established by Tufts in the Fall of 1982. It has been charged to develop a curriculum for the future of the institution. Planning for the new curriculum is being coordinated with planning for the development of a Health Science Education Building--a facility planned as an integrated education, information, and communication resource.

Initial discussions led to the identification of areas of both concern and agreement:

There is a consensus that the basic sciences are the foundation upon which the clinical experience must be built and an integration of the two areas should be maintained throughout all four years. It is generally accepted, however, that there is an ever-increasing need for selection to be made of the material in each discipline and content area that should be didactically presented to the students and that can be covered by various means of "independent" study. Better coordination of these curricular components is needed.

The faculty feels strongly that the curriculum should be designed to better stimulate active, investigative thinking and critical analysis on the part of the students, rather than an emphasis on rote learning. Classroom exercises, as well as evaluation instruments, should emphasize generalization from factual material and the understanding of process, problem solving; conceptualization and decisions making; focused upon the ability to integrate the basic sciences with the clinical aspects of medicine.

There is a need to change the primary focus from "teaching" to the "facilitation of learning" with the student being responsible for his/her own education. An emphasis on problem solving will require an increased emphasis on active faculty/student interchange through the use of small discussion groups, tutorials, laboratory exercises, patient simulations and/or direct patient contact, and a decreased emphasis on the use of lectures.

A large proportion of the faculty recognize their need for help in enhancing their effectiveness as teachers. Faculty must be educated as to the potential of microcomputers as learning tools and to develop other kinds of instructional packages as well.

Skill in information management will become increasingly important for their future graduates, as they will need access to a wide variety of computerized data bases, an electronic library for scientific information, and computers for medical records, as well as their use in clinical decision analysis.

Tufts' new Health Science Education Building, in which information management and transmittal are to be a central focus of the building and library programs, will be a learning resource center whose modern education technology will better enable students to gain the facility in information technology and computer interaction required for their future needs.

TULANE UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: David E. Smith, M.D.
Associate Dean for Academic and Curricular Affairs
1430 Tulane Avenue
New Orleans, LA 70112
(504) 588-5263

Comments that follow were generated by small groups comprised of faculty and students using Delbecq's Nominal Group Process. The comments do not represent institutional policy or position. It was pointed out that Tulane is not presently engaged in any major revision of curriculum; authoritative statements at this time could well have little relation to later developments when specific problems are addressed by different groups. Furthermore, it has been an established practice at Tulane to encourage faculty members to assume individual responsibility regarding their teaching endeavors and at the same time to have considerable freedom in designing their approach to instructional activities.

Eight members of the Curriculum Committee considered the three most fundamental personal qualities to be nurtured among potential and active medical students to be a sense of responsibility, honesty, and concern for people.

A volunteer group of five senior basic science faculty, who wanted to generate revisions in Tulane's rather conservative curriculum of the first two years met, but the leader was unable to arrest a spontaneous, critical discussion of the AAMC Charges. There was general perception that the presentation of questions was prejudiced and biased towards answers and concepts with which members of the group disagreed. This group felt strongly that it would be more important to debate those assumptions than to answer the often methodical and operative questions in the Charges.

An invited group of six faculty and three students were assigned the question regarding the establishment of criteria to define the breadth of education. Discussants criticized the phraseology of the question, which was perceived as announcing certain tenets without inviting debate and then asking a methodical question rather than one of principle.

They recognized four ideas as significantly relative to the concepts of a broad preparatory education for a physician: (1) the criteria of a broad education should be developed with broad representation from medical faculty and students, members of arts and sciences faculties, faculties of other professional schools, alumni, and the general public; (2) a broadly defined "experience year" should be interposed between graduation from college and entry into medical school; (3) medical faculties should make certain that their basic sciences curriculum neither penalizes nor rewards students dependent upon their prior amount of science education; and (4) colleges should address the general requirements of their baccalaureate degrees and the result should be a rigorous enough definition of distribution requirements that it would be adequate for all graduates, as well as for premedical students.

A group of five invited faculty and three students attempted to predict the effect of proliferating information technology on the content of "essential knowledge." The three best suggestions were (1) very little influence on the quantity and nature of education; (2) "essential knowledge" will become skill in discrimination; and (3) will not destroy personal qualities of the physician/patient relation and will free time to develop same.

Methods by which faculties could differentiate basic from specialized skills were addressed by another invited group of four faculty and two students. By emphasis that the questions enquired about methods, the group was led away from discussion of skills per se. Two of the most popular ideas directed the performance of studies of actual use of skills, and the general tenor was a positive response to the desirability of deriving an agreed upon inventory of basic, in contrast to specialized, skills. The four best accepted suggestions were (1) perform a critical incident study of skills demanded of new graduates during the first month of their residencies; (2) derive a list of the skills necessary for students to meet the agreed-upon goals of the undergraduate medical curriculum; (3) perform a critical study of the skills a beginning medical student needs on first exposure to the study of a patient in order to achieve the educational goals of his instructor; and (4) create work groups composed of medical faculty, allied health practitioners, and lay persons to derive a list of basic skills.

UNIVERSITY OF UTAH SCHOOL OF MEDICINE

For Additional
Information, Contact: Calvin W. Taylor, Ph.D.
Professor of Psychology
Social and Behavioral Sciences Building
Salt Lake City, UT 84132
(801) 581-6877

Dr. Taylor reported on Utah's sustained studies of two decades on the measurement of physicians-in-practice and physicians-in-training, most of which have focused on the measurement and prediction of physician performances and attributes. These studies included major efforts to define and describe all of the most essential performances and attributes of excellent physicians-in-practice. To establish criteria of excellent physicians-in-practice, they obtained responses from 372 physicians, each of whom mentioned several qualities believed to be most important for excellent or superior performance. This list was then submitted to more than 100 individuals--educators, college and medical students, house officers, administrators, a wide range of professional people, etc. Each was asked to provide criticisms, additions, and fresh expressions of opinion. In this way a list of 87 items of positive performances and attributes and 29 negative (undesirable) ones was generated. All 116 of these items were rank ordered by 1,604 persons representing 100 different subgroups, which covered most types of the total population to be served by physicians-in-practice.

Nearly 90 of these positive and negative characteristics were applied to a sample of 167 practicing physicians (almost equal-sized groups of urban general practitioners, rural general practitioners, and certified specialists in surgery, pediatrics, and internal medicine). Five different sources of measuring the performance and attributes of each physician were used. On the average there were 9.4 observer/raters per physician. This totalled 50,736 information items in the study after nearly 10,000 items of information had been collected earlier in the pilot study on 10 other physicians. The items were categorized into 11 conceptual scores designated as follows:

1. Diagnostic/therapeutic skills and performance
2. Keeping abreast
3. General intellectual characteristics
4. Human relations in dealing with patients (and families)
5. Ethics and character
6. Altruistic dedication to medicine
7. Human relations with other health professionals
8. Physical endurance
9. Quality of business practices
10. Communicating with and instructing others
11. Negative characteristics.

These composite scores were substantiated through one item-factor-analysis study upon the data from one type of observer/rater. The homogeniety of items within these scores were checked for reliability and for various goodness checks

---

This summary was drawn from testimony presented by Dr. Calvin Taylor at the AAMC Western Regional Hearings held January 27-28, 1983.

on the convergent and other types of validity of these scores. The level of intercorrelation among these 11 scores is reportable and generally tends to be quite low. The overall rank ordering of each of the 116 items can be given as a handout along with the ranking of the relative importance of each of the 11 composite scores. Thus, medical administrators and curriculum specialists can work at the detailed levels of the 116 items or at a broader level of the 11 composite scores. If they desire, it would be possible, with a minimal further data analysis, to reduce the 11 composite scores to a much smaller number of categories, each of which would be more complex internally than the 11 composite scores.

Furthermore, anyone who desires can increase the importance level of the list of items by eliminating those of lower importance; i.e., items which were judged, with considerable consistency by the 1,604 raters, to be of relatively little importance or of no importance (inconsequential). Likewise they could delete these lower items that appeared in each of the 11 composite scores to bring about a higher importance level of the remaining items that make up the shortened composite scores. The same techniques could be applied if the 11 were reduced to a fewer number of categories such as 3 or 4 or 5.

For nearly the last decade, they have implemented their findings into the training of interns and residents, primarily in surgery. This involved revision of their measurement processes and of the coverage of their measurement forms. Throughout this entire implementation period, they evaluated the progress of each trainee six times a year, and attempted to overlap the ultimate target of physicians-in-practice as much as possible. One estimate is that the areas measured in physicians-in-practice and the physicians-in-training (interns and residents) overlapped about 85%. During this period they prodcued the following research reports for internal project purposes and for larger audiences at national and international meetings: (1) Utah Continuing Studies on Physicians and Physician-in-Training Performance (RIME); (2) development of trainee and teaching-service evaluation forms and feedback procedures for surgical interns and residents; (3) measuring residents in specialty training in a broad band of physician-like performances and attributes (NATO); (4) all students are educationally deprived: the benefits of broadening both the educational and measurement base (NATO); (5) multifactor evaluations of surgical trainees and teaching services (surgery); (6) evaluations and implications of a system for measuring the performance of interns and residents in training; and (7) evaluating the performances of resident-physicians against the target of excellent physicians in practice (ABMS).

In all of this implementation work they have tried to have the measurement as much as possible on the target of the performance and attributes of physicians in practice. In effect they used their newly constructed measuring instruments to function as "change agents" or "improvement agents" by stretching their measures to cover almost the entire ultimate target of practicing physicians. In this way a challenge has been put to training programs to broaden their base of educational coverage in order to match the already broadened base of measurement, which has been designed to evaluate how well the residents and interns are functioning in training. Although the primary focus in their completed studies has been on wide coverage in good measurement, by looking at their data and processing it differently, they are able to obtain new results from their data bank. These can be presented in the form designed to help curriculum specialists and other medical educators and decision makers to examine the whole spectrum of medical education.

UNIVERSITY OF VIRGINIA SCHOOL OF MEDICINE AND COLLEGE OF ARTS AND SCIENCES

For Additional
Information, Contact: Daniel N. Mohler, M.D.
Associate Dean for Academic
Affairs, Box 395
Charlottesville, VA 22908
(804) 924-5118

Thomas L. Pearce, Ph.D.
Assistant Dean, College
of Arts and Sciences
Garrett Hall
Charlottesville, VA 22903
(804) 924-8914

This abstract is based on the report of faculty and student deliberations conducted separately by and within, respectively, the College of Arts and Sciences and the School of Medicine.

Major institutional concerns from the College of Arts and Sciences are (1) medical schools, through entrance requirements, to some extent control premedical curricula; (2) future physicians, in college and medical school, need to develop problem-solving skills, a love of learning, and a firm sense of their own intellectual, social, and moral growth; (3) premedical students as a group tend to avoid rigorous nonscience courses; this is deleterious to their liberal education; (4) premedical education does not necessarily encourage independent learning; and (5) future clinical physicians should be broadly educated, not narrowly trained.

Major institutional concerns from the School of Medicine are (1) there should be better coordination between the basic science and clinical phases of the curriculum with more input from clinical faculty into basic science teaching and vice-versa; (2) the application of information systems to the health sciences, particularly computer technology, should be incorporated into all phases of the curriculum; (3) there should be increased emphasis on critical evaluation of medical literature in order to develop skills in analysis and criticism; (4) there should be more emphasis on essential scientific concepts and problem solving and less on memorization of scientific details; (5) there should be more emphasis on independent study to develop skills that will be useful throughout the physician's career in keeping abreast of advancing knowledge; and (6) selection of students for medical school should be more broadly based with less reliance on GPA and MCAT scores.

The School of Medicine is considering the following:

1. A better faculty reward system for skilled teachers. In order for this to occur, a more objective evaluation system of effective teaching will need to be developed and used as a significant factor in tenure decisions made by the Faculty Promotions Committee and the Dean.

2. A better delineation of educational goals for all courses so that students will have a clearer understanding of what is expected of them.

UNIVERSITY OF WASHINGTON SCHOOL OF MEDICINE

For Additional
Information, Contact: Theodore J. Phillips, M.D.
Associate Dean for Academic
Affairs, SC-64
UW School of Medicine
Seattle, WA 98195
(206) 543-8909

Six major concerns were reported by the University of Washington/Seattle:

1. Admission prerequisites are stated rigidly in terms of specific, historically accepted science courses that may or may not provide the student with the knowledge, skills, and attitudes desired in preparation for the medical school curriculum.

2. The curriculum and admission requirements may be producing students who learn the facts and knowledge derived from disciplines underlying medicine but may not understand the principles and methods of those disciplines.

3. The curriculum may not allow for individual variation in learning and cognitive styles among students.

4. The clinical core of the curriculum should be defined better and individual clinical clerkships designed in such a way as to complement and reinforce each other and the basic curriculum of the first two years. Specific areas needing reinforcement are the behavioral and community medicine aspects of the basic curriculum, as well as the basic biomedical sciences.

5. If these concerns are to be addressed, the pressures on student time will have to be reduced in order to allow the independent study and exploration both faculty and students desire.

6. U.S. medical schools may be producing an excessive number of physicians.

With the class entering in 1982, a number of curriculum revisions were instituted:

Admission prerequisites. A small group of basic science faculty are attempting to create a self-assessment examination that students may take prior to matriculation. This will be designed to identify for entering students knowledge the School of Medicine faculty will expect and assume at the start of the basic curriculum courses of the first two years.

Understanding the principles and methods of the disciplines underlying medicine. Each student is expected to earn ten credits in a requirement termed "Independent Study in Medical Sciences" by independent study or investigation in one or more of the biological, behavioral, sociocultural, or epidemiological sciences basic to medicine.

Curriculum rigidity. To promote independent study and self-motivated learning, the number of lecture hours in the first two years has been reduced by ten percent. Faculty in the basic curriculum are revising course syllabi to ensure that each course has a clear statement of objectives with a listing of resources that may be used to achieve these objectives.

Definition of clinical core. A faculty committee is reviewing the content and objectives of each clerkship in the required clinical core: Emergency Care/Trauma, Family Medicine, Internal Medicine, Obstetrics/Gynecology, Pediatrics, Psychiatry, Rehabilitation Medicine/Chronic Care, and Surgery.

Excessive time requirements in the curriculum. Sixty hours was defined as the expected work week for the average student in the first two years. Each course was, therefore, assigned a total number of hours for student work rather than only in-class hours with no consideration for hours spent outside of class. All required courses were reviewed with this as a goal and adjustments were made in assigned hours. In the basic curriculum of the first two years, scheduled in-class time now ranges from 22 to 28 hours per week in each of the six quarters.

Advising system. The "Vertical Adviser Group" system, now in effect, consists of two faculty advisers (one basic scientist, one clinician) and four students from each of the four classes. It is too early to evaluate the effectiveness of this system.

Class size. Study of this issue is now underway to determine whether the quality of the educational program would be enhanced by a reduction in class size.

Technologic changes in information management. Debate continues within the faculty concerning the manner in which the curriculum should introduce students to modern, computerized information management systems.

MEDICAL COLLEGE OF WISCONSIN

For Additional
Information, Contact: Jeffrey H. Garrison, M.D.
1545 South Layton Blvd.
Milwaukee, WI 53215
(414) 383-4490

Five major institutional concerns, and components of each, were reported:

1. Broad educational and life experiences are generally inadequately advocated for the student preparing to become a physician: college students take too few advanced humanities and fine arts courses; the MCAT overemphasizes the prediction of medical school academic performance rather than well-rounded performance as a physician; information management technology skills are not broadly based; students are not learning to be self-educators; faculty often role model narrow behaviors and perspectives; the NBME, especially Part I, does not have an adequate balance of factual learning with skills of synthesis and problem solving; there is little advocacy for nonacademic life experience with depth as well as breadth; there is inadequate emphasis on pluralism in the selection process and in the curriculum; student individuality is occasionally inhibited rather than guided by faculty; premedical and medical environments often foster unconstructive competition; and rarely is the role of love or its lack considered in the process of illness or healing. College and medical education often avoid variables that are not readily controlled.

2. A "criterion referenced" evaluation system is needed: a predictable core educational experience for the student in college and medical school does not exist. Sometimes there is a "perceived" core, which tends to crowd out important broadening experiences; medical school senior electives have not had clear educational objectives and evaluation methods; and students are not reliably evaluated for all categories of facts, concepts, and behaviors that are expected to be mastered.

3. Faculty are not reliably rewarded for effective teaching: there is no conscious balance among the rewards for effectiveness in clinical service, research, and teaching; and effective teaching is not determined by responsible assessment.

4. Basic and clinical science teaching is only marginally integrated: teaching time is too compartmentalized, and the functional separation of the basic and clinical science faculty exaggerates the problem.

5. Communication skills training is not formally emphasized: the quality of written and oral communication is only superficially considered during the process of estimating the student's fitness to become a physician; college students do not predictably experience courses that encourage all aspects of literacy in the humanities and science; listening as an aspect of communication is inadequately overtly taught or role modeled; and communication in difficult contexts takes courage that can best be taught through role modeling.

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL

For Additional
Information, Contact: John W. Anderson, Ph.D.
Assistant Dean for Students
1300 University Avenue
Madison, WI 53706
(608) 263-4920

Faculty and students at Wisconsin discussed the "Charges" booklet against local institutional goals. A considerable amount of time and attention was given to discussing the need for basing all curricular review and change on a common set of objectives agreed to by the faculty. A by-product of using objectives for reviewing the curriculum will be the possibility of having a more productive continuing review, rather than having a "decennial convulsion, with all the attendant anguish and hurt feelings."

A radical suggestion was made, to reverse the third and fourth years of the curriculum; that is, to start with specialty clinics and end with the inpatient services. The basic idea is to start third-year students in outpatient clinics on a rotating basis. The following advantages were seen for beginning the third year in this way:

1. Many of the concepts of the second-year courses would be reinforced, e.g., examining and listening to the heart sounds of 20 or 30 cardiovascular cases in a day.

2. The outpatient experience is more like that of private practice.

3. Tendency to see patients isolated from their natural environments would be decreased.

4. The student would experience less hurting of patients, fewer hopeless cases, less death.

5. Because this experience is closer to second-year material, the more orderly progression would be advantageous; and, as an important corollary, it would reduce the pressures that the clinical faculty feel in teaching in the second year, to include too much clinical material in that year.

Naturally, there are serious problems, at least some of which can be alleviated by having this initial outpatient experience limited to several months, rather than occupying the entire year. The difficulties are identified as follows:

1. The problem of the timing of the search for postgraduate positions.

2. It would require more faculty time; and an attendant reduction in the involvement of residents in the teaching.

3. Faculty might be reluctant to subject their patients to the inquiring minds and proddings of third-year medical students.

4. In the words of one member, the presence of students would "increase the viscosity of the clinic," perhaps beyond reason.

WISCONSIN PAGE TWO

Lastly, there was considerable agreement that the "personal qualities, values, and attitudes" that medical students bring with them when they enter are more important than any program that could be devised to inculcate those attributes. To the extent that desirable qualities can be identified, faculty should ensure that the program enhances, rather than compromising or defeating them, but the most important way of maximizing those qualities is to seek them in the applicant pool.

WRIGHT STATE UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: John Lindower, M.D., Ph.D.
Associate Dean for Academic Affairs
Post Office Box 927
Dayton, OH 45401
(513) 873-2161

The major institutional concerns about the general professional education of the physician that the Wright State University School of Medicine (WSUSOM) is addressing are teaching essential concepts, differentiating essential clerkships, developing skills for independent learning, and coping with emotional stress.

A month-long postclerkship educational program has been designed by a curriculum planning group to consolidate core medical education. Senior students appear to benefit from this program for directed review of fundamental clinical tactics prior to individual selective programs. The active study of recurrent clinical themes and their supporting basic science concepts can provide the proper method for exposition into the formulation of current medical practice policy. This program has also provided an introduction to the principles of lifelong learning. Part of the reason for creation of this postclerkship program is the community-based structure of the medical school: students and faculty are distributed in many affiliated institutions. The foundation and model for the entire postclerkship conference design have been a series of sessions called "The Scientific Basis of Medicine."

Given the diversity of learning styles within the student body, the development of independent learning skills is essential. To allow students to vary their rate of academic progress in the preclerkship curriculum with faculty guidance, an Individualized Advancement Program is being developed. In this program, students will be expected to recognize and acknowledge deficiencies in learning skills. Then, in consultation with faculty and designated resource people, the student should participate in the development of his/her individualized strategy for correcting these deficiencies.

Student stress arises from a number of sources, including the pace of the curriculum, changes in lifestyle, financial and other personal responsibilities, self-doubts, etc. WSUSOM faculty are particularly sensitive to the emotional stress students encounter and employ several mechanisms in addressing this problem.

YALE UNIVERSITY SCHOOL OF MEDICINE

For Additional
Information, Contact: Howard Levitin, M.D.
Dean of Students
333 Cedar Street
New Haven, CT 06510
(203) 785-2644 x7654

Yale's four-year program is divided into preclinical and clinical phases. The first three semesters are devoted to preclinical science courses and the third year is occupied by clinical clerkship rotations. Between these segments an integrated program in the fourth semester provides an introduction to clinical medicine. In this semester students are offered, for the first time, formal instruction in clinical assessment, diagnostic procedures, and pathophysiology. Thus, during much of the first two years, teaching is in a classroom situation. The formal work in nearly all of these courses is approached by a combination of lectures and small group discussions, or in a few laboratory sessions that meet regularly during the course.

Having characterized Yale's present curriculum as being nearly classical in its resemblance to the formula standardized early in this century, Dr. Wright observed that the milieu in which this general structure exists very likely differs from that in many other schools. Despite periodic revisions of the schedule of courses, the general policy governing implementation of the schedule has persisted with little change since it was adopted more than 50 years ago. Primary responsibility for setting priorities and for successfully completing their medical studies is vested with the students. Advancement of individual students proceeds at a rate best for each student. A thesis is required of all students. Examinations are not required during or at the conclusion of individual courses. Proficiency in preclinical subjects is demonstrated by successfully passing a comprehensive examination. This requirement is met by passing the National Board Exam Part I. Importantly, this policy does not provide the means to grade and rank students. The Yale system provides an environment in which mature and self-motivated students work at their own pace without frequently visible elements of coercion and without the ultimate threat of grading and ranking. The Yale system attempts to foster the development of the capacity for learning by granting freedom and responsibility and by removing the kind of pressures that encourage destructive forms of competition or striving for grades. Attendance at classes is not required.

It would be a great service if the AAMC project panel report restated the important differences between individual academic programs leading to a degree, and the process of certification qualifying graduates to practice medicine. Certification ought to remain exclusively with licensing boards. They should set their own standards of competence for the practice of medicine in their jurisdictions. Schools should develop their own curricula and, thus, be able to innovate and to respond to their own particular strengths. As the panel reviews medical education throughout the country, it is important to preserve the possibility of individual innovations and approaches and to avoid setting particular guidelines that could well serve particular interest groups who might want one specific course or another to be taught in all schools. The curriculum should not be a political issue open to coercion by such interest groups.

This summary was drawn from testimony presented by Dr. Fred S. Wright at the AAMC Northeastern Regional Hearings held May 5-6, 1983.

The features of medical education at Yale, the traditional course structure, and the unusual, although now long-standing approach to requirements, are really technical matters. What it is that Yale is trying to teach and what this structure is supposed to enable students to learn remain the focus of Yale's continuing concern--providing general education for future physicians. Yale has attempted to develop and maintain a program that treats the medical school years as preparation for further postgraduate training, not as preparation sufficient for medical practice. To do this, two elements are essential: a secure grounding in the sciences relevant to medical practice; and clinical activities that develop habits of mind and behavior that will outlast particular, currently popular techniques of diagnosis and treatment.

This is not to demean or ignore concerns with qualities, values, and attitudes. Doctors must be able to respond to patients' needs in a compassionate and understanding manner. The admissions committee must recruit students who possess, and the medical school program must foster continuing development of, those qualities necessary in the wise and caring physician, but concern for humane and compassionate medical care is not an alternative to dedication to scientific knowledge or clinical acumen.

Medical education should equip the student with a scientific approach to medical problems, the skills necessary to obtain clinical information, and the ability to respond in a compassionate manner to the problems of patients. Medical education should emphasize problem-solving that is independent of a large, instantly recalled data base. Increasingly, the ability to master all of the information necessary to practice medicine will become a more distant and unachievable goal and the use of information retrieval systems will become increasingly common. Therefore, it is important for the medical student and the future physician to be able to acquire necessary information from available sources, to learn to use this information to solve clinical problems, and to do this while retaining and developing the capacity to offer understanding and sympathy to fellow humans when they sorely need it.

SUMMARIES OF REPORTS FROM UNDERGRADUATE COLLEGES AND UNIVERSITIES

BRANDEIS UNIVERSITY

For Additional
Information, Contact: Coordinator of Health Professions Advising
Office of the Dean of the College
Waltham, MA 02254
(617) 647-2111

The Board of Premedical Advisors, a faculty committee involved in advising premedical students, was responsible for the report from Brandeis. Information for the report also included views of alumni now in medical schools.

Brandeis students fare very well in their application for admission to medical schools. However, in the course of developing the report, the Board identified some modifications by which to enhance a preexisting program of effective and sound premedical education. The following changes were introduced:

1. Faculty will become further involved in advising students about their curricula (particularly in areas of modification as identified by this study). In addition, two members of the Board, both social scientists, will engage in a study of the "premedical subculture." Prior to this effort, these faculty members expressed interest in discovering the values, beliefs, and behavior of premedical students, and in ascertaining which of these they bring with them from home and which they acquired within the University.

2. Senior research projects in science will continue to be encouraged for Brandeis premedical students. Since research experience is valuable training, and as Brandeis has excellent facilities, members of the Board plan to promote these research projects.

3. An increased understanding of economics and societal issues in medicine would be beneficial to students applying to medical school. As a result of this study, premedical students will be encouraged to take one course in medical sociology, medical anthropology, or medical economics -- for which there are appropriate existing courses in the Brandeis curriculum.

4. The majority of premedical students concentrate in one of the sciences. While this is not seen as a problem, information about medical school acceptance rates for applicants with various majors will be made available to premedical students. In this way, students who choose to major in a nonscience field of study, will know for a fact that in so doing they are not harming their chances toward medical school admission.

5. To enhance the performance of Brandeis students on the Quantitative skills sections of the MCAT, premedical students will be further encouraged to acquire knowledge in appropriate college level mathematics courses in concordance with concentration and departmental requirements. (i.e. recommended calculus courses and where practicable - courses in statistics, or other relevant programs of mathematic l study).

6. Advanced and effective college level skills in problem solving, communication, and expository writing are integral and vital educational goals for University Studies at Brandeis. All undergraduate students are required to develop their abilities in these essential areas. Naturally, evolution of such coursework and educational methods is an ongoing process at this University; the Board of Premedical Advisors continues to explore methods of teaching students to think and write more clearly, and to develop their problem-solving abilities.

With regard to developing skills, these were some of the observations of the Board of Premedical Advisors:

1. Assignments, tests, and laboratory reports that require thinking, describing, analyzing, and explaining will facilitate the development of skills in independent learning. Teaching that requires straight memorization, use of multiple-choice tests (and similar tests), and laboratory reports where the student simply fills in the blanks, will not facilitate independent learning skills.

2. More and more students are learning programming and computer use in high school and college (and perhaps in elementary school as well). In the near future, it is believed that nearly all students who enter medical school will be familiar with at least the simpler aspects of computer use--without medical schools having to take any action to encourage their learning this field.

Brandeis faculty believe that premedical students work hard. This stands to reason because the science courses are demanding and rigorous. It is also felt that the great majority of premedical students are cooperative and friendly with each other. Indeed, the Board's concerns toward premedical students are not altogether different from those we have about all students. They want students to acquire a broad education, do intensive study in at least one field, and to develop their abilities to the fullest.

BRIGHAM YOUNG UNIVERSITY

For Additional
Information, Contact: Don Bloxham, Ph.D.
Chief Health Professions Advisor
330 WIDB
Provo, UT 84602
(801) 378-3044

A total of 18 premedical students and eight faculty members were involved in this study. In preparing this report, three issues of major concern were identified: lack of intellectual drive, stress, and deficiencies in premedical preparation.

Lack of intellectual drive. Many premedical students feel that their sole purpose at the university is to get into medical school and base their entire college curricula on that goal. This creates two major problems: first, students restrict their choice of classes to a very narrow curriculum, and second, students place more emphasis on grades than they do on learning.

A restricted curriculum is the result of what may be a mistaken notion on the part of the premedical student that medical school admissions committees desire to see a preponderance of science courses on an applicant's transcript. Medical schools need to change this message they are giving to premedical students. Premedical advisers should actively encourage students to take a wide variety of courses from all areas of study.

Changes in the MCAT could further encourage students to achieve breadth in their course work: the MCAT could be modified to include a section or sections on general knowledge, e.g., a student could choose to take either a section in humanities or one of the social sciences. Also an essay, independently graded on several dimensions relating to writing and content, could be included as part of the MCAT It could either be written on the day of the MCAT or on the day of the medical school interview. This essay, however, should be evaluated independently rather than by members of the medical school admissions committee.

Perhaps the larger problem is the emphasis students place upon grades. The importance of grades is recognized in the evaluation of a medical school applicant but it is tragic that students shortsightedly compromise their education for the sake of grades. A problem that is generally considered to be national in scale is that faculty members may encourage such behavior on the part of the students, stressing rote memorization without motivating the students to think about what they have learned.

Classes that develop good reading skills (literature, philosophy, logic, and many graduate level courses) require students to read extensively, critique what is written, and synthesize new ideas. Analytical problem-solving skills are learned when students must continually analyze raw data and solve problems from real life situations. Mathematics, physics, chemistry, and physiology can promote such skills although they are often quite structured and theoretical. When "knowledge" is laid out in a neat and concise package for learning, the students learn not to question or analyze beyond these comfortable limits. (Much depends upon the teacher, for any subject, if properly taught, can lead to critical thinking and creative problem solving.)

Further development of skills will be realized when students value the learning process and are internally motivated to learn. Examinations should place more emphasis on developing skills that require the student to demonstrate mastery of the subject being studied, including the ability to apply principles in situations not previously encountered.

Informal learning experiences should be stressed and must be broadened. A student must assume responsibility for his own education and not be locked into a rigid program which stifles his intellectual drive and imagination.

Stress. Several suggestions were offered to alleviate undue stress that premedical students experience. Small seminars, research groups, informal gatherings, etc. that allow students to work together with each other and with the faculty in a spirit of cooperation should be implemented. Also, a grading system based upon carefully predetermined standards should be used. To prevent the grade inflation that is naturally inherent in such a system, Brigham Young recommends the use of national tests to help set the standards. Students, therefore, may be more inclined to work together and help each other rather than engage in "cutthroat" competition for the few top grades.

Perhaps the main cause of stress is the fact that many students link their identity and self-worth to their acceptance into medical school. Premedical advisers should be familiar with information on acceptable alternatives to medical school in order to lessen this feeling.

Deficiences in Premedical Preparation. College students need to be more involved with the medical profession so that each student has sufficient information to make an intelligent career choice. These could include the following experiences: (1) seminars of physicians, head nurses, hospital administrators, and other health care professionals in dialogue with the students; (2) field placements in doctors' offices, hospitals, etc. so that students can actually see how medicine is practiced; (3) individuals at various stages of training (medical students, interns, residents) could speak to premedical students and share with them their perceptions of the profession and problems experienced.

Several premedical service courses should be instituted. This should include a first semester course with considerable interface among senior premedical students, faculty, local physicians, and the premedical adviser. The second semester should include a course in medical history. Later semesters could include such topics as business management, medical sociology, economics, professionalism, biomedical ethics, and communications skills, to name a few.

A course should be instituted that includes the concepts that must be understood to read technical and scientific materials efficiently. These concepts include a knowledge of the vocabulary and style used in technical literature as well as the techniques of nonlinear extraction and the interpretation of graphics. These concepts should be a part of any course in directed readings of scientific literature.

There needs to be clear communication between medical schools and undergraduate institutions. Many students express an uncertainty as to what is expected of them and therefore simply copy what other accepted applicants have done. This is especially true in the area of essential knowledge. Medical school faculties, working with undergraduate faculties, need to closely address the issue of what scientific and general knowledge medical students should get in undergraduate school.

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

For Additional
Information, Contact: Charles W. Daniel, Ph.D.
Professor of Biology and Chairperson of the
Biology Board of Studies
387 Thimann
University of California
Santa Cruz, CA 95064
(408) 429-2385

The report from this institution dealt with two major areas: first, how advising services at Santa Cruz assist in developing the "well rounded" applicant; and second, recommendations regarding institutional communication between medical and undergraduate premedical advisers.

The University of California at Santa Cruz premed advising services focus on diversity in program planning. Every effort is made to discourage the segregation of premeds from the general population of career planning advisees.

The major areas of emphasis are exploring personality strengths and weaknesses including academic vigor, awareness of favorite electives, and examination of leisure activities for the purpose of self-assessment; field work opportunities; foreign language opportunities and study abroad; journal writing techniques for long-range self-assessment; peer advising support-group participation; colloquia with health professionals; profiles of medical students admitted from Santa Cruz campus reviewed for noncognitive factors as well as academic record; daily drop-in sessions; bulletin board broadcast system of adviser newsletters and pertinent information for premeds and all other health sciences; and comprehensive literature on premed issues to include a wide-range of related health careers.

Midpoint assessment is provided for applicants who have completed prerequisites for medical college. In general, this includes collection of a file in the career planning center to include transcripts, autobiographical information, letters of recommendation, resumes, portfolios, etc. Motivation for medicine and identifying the "unique" qualities of the applicant are stressed during this period. Students are advised on how to proceed in developing an "in-depth" profile of their own particular interests. Attention is given to science courses if needs be, however, the emphasis is on being "different" and double majors as well as individual majors are encouraged. Journals from the early outreach stage as well as the autobiographies are used at this stage of assessment. Literature is provided to assist students in journal and autobiographical writing.

Individual applicant advisement includes assessment of the individual's file by the advisers; cover letters of assessment are available upon request. The focus is upon presenting the "noncognitive" factors for review. Mock interviews are used and workshops on procedures focus on writing candid statements of purpose. The collection of letters of recommendation is provided for students' convenience.

Some AAMC literature for advisers is suggested:

1. Specific schools' profiles of "noncognitive" qualities of the accepted applicants,i.e., anonymous summaries of decision-making process used in selecting that year's applicants to include interview feedback and data from letters used in assessing and accepting the applicants.

2. Data that confirm the medical schools' interest in "nonscience" major students, i.e., academic profile of accepted applicants to specific medical schools.

3. Reports from medical school students to undergraduates on the necessity of particular science courses and/or the helpfulness of nonscience courses in medical school.

4. "Testimonials" from practicing physicians as to the advantages of expanding premed curriculum to outside the natural sciences.

5. Videotapes of sessions at the AAMC, national conferences, and regional conferences that deal with topics pertinent to prospective applicants.

CARLETON COLLEGE

For Additional
Information, Contact: Mary Caroline Henry, Ph.D.
610 East 3rd Street
Northfield, MN 55057
(507) 663-0471

Representatives from Carleton College's Faculty Advisory Committee on Health Professions Programs, premedical students, and former premedical students (now planning other careers) studied the "Charges to Working Groups" in small discussion groups. They report the following major institutional concerns:

Criteria for admission to medical colleges conflict with the educational aims of a liberal arts college. In most of their courses the goal is to encourage students to think and reason for themselves. Comprehension of concepts and application of concepts to a variety of situations or problems are emphasized. They discourage rote memorization of large bodies of factual material or mathematical equations, but instead encourage students to learn how and where to find the information they need. They point out that the AAMC working groups on Essential Knowledge and Fundamental Skills espouse these same goals; this, however, is not what they see as the current basis for admission to medical college.

The above leads Carleton College to cite as inappropriate the criteria for admission to medical colleges. Almost total reliance on GPA and MCAT scores in the early stages of consideration of applicants often causes medical colleges to pass over well-qualified and highly motivated persons. Carleton has a highly selective admissions policy and has not suffered as high a degree of grade inflation as most American colleges in recent years. Consequently, Carleton students are at a definite disadvantage when compared on the basis of GPA. They have the following recommendations:

1. Greater weight should be given to motivation, independent projects and research, ability to communicate effectively, and evidence of maturity and responsibility.

2. The following course requirements should be added: a) a minimum of three courses in social sciences or humanities, with at least two of them past the introductory level (the former premeds recommended literature, history, philosophy, or religion to be of great value in broadening outlook and methods of approaching subjects); b) an essay on a nonscientific subject of the student's choosing, to be submitted with other AMCAS materials or as part of the MCAT, with a followup of the subject matter of this essay in any interviews conducted by medical college admissions committees; c) a course in computer programming; and d) a course in statistics, which would have much greater use in either clinical practice or medical research than more abstract mathematics such as calculus.

Excessive importance of the MCAT is another concern. Students who had taken the MCAT wondered why the eight hours of examination could not be spread over two days. The sections on chemistry, biology, and physics seemed to test memorization rather than comprehension of material or ability to apply it. Several persons even suggested that thoughtfulness and critical analysis actually lower a student's MCAT scores. Even the Skills Analysis and Science Problems sections were criticized for giving an advantage to students with greater backgrounds of factual information. The Skills Analysis: Quantitative Section was strongly criticized by the students for asking "picky and tricky" questions. The importance of quantitative skill in the practice of medicine is in understanding the relationships between factors and results, reading data accurately, and synthesizing information, and the students did not think this was well tested.

The students suggested that more of the exam be of the format of the Reading Section, perhaps with actual research reports in chemistry, biology, and physics to read, interpret, and apply. They also suggested the addition of a social sciences section with format similar to that of the Reading Section -- that is, not requiring specific factual information, but testing ability to comprehend and apply material in the social sciences. The question was raised as to how MCAT scores are correlated with academic performance in medical colleges and also with later effective practice of medicine.

Some suggestions about teaching follow: objective tests and a requirement for memorization of large bodies of material are generally contrary to the development of independent learning skills; excessive dependence on a single source for acquisition of course material, particularly dependence on lecture notes, hinders independent learning; independent research and open-ended laboratory exercises require independent thought and planning by students; and, overall, the aims of educational strategies should be an open mind ready to change ideas and opinions and a sort of built-in skepticism when new information is encountered.

Several desirable qualities that were mentioned as essential to a physician are: integrity, respect for persons, and ability to work with others in a constructive and cooperative way. Faculty members should avoid procedures, such as grading on a strict curve, which encourage cheating or excessive competition. They can require teamwork in classroom and laboratory projects.

Former premeds described negative aspects of the popular stereotype of the premed: self-centered, highly competitive, lacking in compassion for or even interest in other people, and isolated from the campus community. One method they suggested for combatting competition and isolation was to set up group activities, both social (picnics) and academic (speakers on such topics as bioethics), for premeds to get acquainted and interact with each other outside classrooms and laboratories.

Involvement in community service or other work with people is highly desirable as evidence of realistic motivation for clinical medicine.

CLEMSON UNIVERSITY

For Additional
Information, Contact: Frank A. Burtner, Ph.D.
Professor of Sociology and Coordinator,
Preprofessional Health Education
100 Hardin Hall
Clemson University
Clemson, SC 29631
(803) 656-3422

Clemson University's Preprofessional Health Education Committee reported the following major institutional concerns about the general professional education of the physician and college preparation for medicine: the narrow focus of students preparing to study medicine; the problem of lack of informal interaction with faculty; and the lack of consensus on what constitutes essential knowledge, as well as essential skills, for those preparing to study medicine.

In general, there is a division among those teaching students who are preparing to study medicine. There are those who believe that students preparing for medicine can never have enough science education, pointing to the MCAT topics as incontrovertible evidence that schools of medicine feel the same way. In addition, the curriculum of the first two years of medical school underlines that the more background an undergraduate has in science the better the chance of survival, and this is reinforced by feedback from first-year medical students. On the other hand, there are those who applaud recent emphasis on applicants being broadly educated, no matter the major, despite the lack of any large-scale concrete evidence that committees on admissions actually are implementing this emphasis. The latter group enthusiastically endorses the move from technician to physician.

On the essential knowledge that all students must acquire the following suggestions were offered:

1. Courses should be provided for computer users.

2. Efforts can be made by educators in both colleges and medical schools to provide detailed outlines of courses, or lists of competencies, a student should master after a given course. Teaching faculty would then be able to indicate by grades if this knowledge had been obtained.

3. If medical colleges are serious in emphasizing the broad background needed for successful completion of the clinical years, then the sections of the MCAT should reflect interest in the liberal arts and humanities as a clear signal to students, advisers, and administrators of a shift in emphasis in preparation for the study of medicine.

On the fundamental skills that all students must acquire the following suggestions were given:

1. Core curricula in technical fields represent the classical approach to developing skills in reading, quantitative analytic reasoning, and problem solving. In the humanities and social sciences, core courses provide the student with nontechnical reasoning skills. The standard core curricula provide an appropriate

base in the fundamental skills, no matter what career a student may pursue. As far as upper level and elective courses are concerned, perhaps a broad selection of technical courses is preferable for developing these skills, although a humanities minor is desirable, even for nonmedically related technical fields.

Comprehensive tests, such as the MCAT, have their place and do provide some measure of a student's capabilities; however, they are inherently flawed in that they tend to evaluate test taking abilities rather than the skills themselves.

2. The development of study habits that can be adapted to independent learning in a subsequent career is a difficult task of the educational process. These habits need to be inculcated with the student's first exposure to formal education. Although these habits can be sharpened and refined in the undergraduate program, it is hard to awaken them at this late stage. Most practicing educators, as opposed to educational theorists, believe that the program or strategy itself is not the prime factor, but rather factors such as student/faculty ratios, availability of resources, adequate supply budgets, and competitive faculty salaries really determine how students develop.

UNIVERSITY OF CONNECTICUT

For Additional
Information, Contact: John A. Tanaka, Ph.D.
Director of the Honors Program
U-147
University of Connecticut
Storrs, CT 06268
(203) 486-4223

David A. Yutzey, Ph.D.
Associate Professor of Psychology and
Chairman of the Premedical and Predental Advisory Committee
Liberal Arts Advisory Center U-126
University of Connecticut
Storrs, CT 06268
(203) 486-2822

Dr. John Tanaka's thoughtful essay on the ideal undergraduate education from the consumer's point of view concludes, "Consumers have certain rights. With respect to health care, the first right is the expectation of receiving technically competent medical care. Second in importance is to have a communicative, caring physician. Having the first without the second is an annoyance. Having the second without the first is unforgivable. The undergraduate training is the first step toward achieving both expectations. Deemphasizing the basic science principles increases the possibility of the unforgivable scenario. Emphasizing a rigorous, balanced curriculum increases the chances of delivering both expectations to the consumer."

He reminds us that some assume that an emphasis on basic sciences is to produce noncaring physicians disinterested in patients as persons, going on to say that "There are abundant examples which statistically as well as anecdotally prove that such is not the case."

His discussion of the importance of science to medicine follows:

"The body of knowledge needed for high quality health care delivery is increasing. As new knowledge is developed, there is a sense of urgency to include this new material in the preparation of the practitioners. Old knowledge continues to be relevant. Educators are faced with a dilemma as to how all the seemingly necessary knowledge can be transmitted from generation to generation within the reasonable time limits devoted to training and preparation. After all, an individual ought to use training to serve society. This means that training cannot occupy too large a portion of an individual's lifetime.

"In order to maximize the effectiveness of training, the hard approach would argue that it is of utmost importance not only to determine if an individual has the intellectual abilities as well as the aptitude and interest for learning the basic science and technology, but also to make sure that the individual has acquired the basic training in these areas which can then be used as a foundation for lifelong learning. Medicine is a science, albeit an inexact science. To practice that science, a grasp of principles is needed as well as an encyclopedic knowledge of facts. In this regard, medicine does not differ from the other sciences.

"In dealing with principles and facts, it should be recognized that principles are most easily learned early in life. Facts can be learned throughout life. It is generally recognized that mathematics must be learned while young. Mathematics can be continued to be used as a tool throughout life, but if the basic concepts of math are not learned in school, there is little chance of later overcoming 'math anxiety.' The same holds for statistics. Quantum mechanics, thermodynamics, or group theory are best learned in school. These subjects are not easily self-taught later in life. Pharmacology or nutritional science, on the other hand, can be more easily self-taught. The basic tools for coping with a science can only be taught early in an individual's education.

"If formal education cannot encompass both basic tools and descriptive material, the previous argument would indicate that some of the descriptive material ought best to be transferred from the formal education period to the informal education period. If the body of knowledge is expanding rapidly, the basic tool emphasis ought to be intensified even at the expense of some loss in the time devoted to descriptive materials. Coping with new developments requires intellectual preparedness. During the period of training, who can predict the nature of the tools and techniques that might be encountered by these students during their active career of medical practice? Would not students with an early exposure to mathematics, physics, and physical chemistry be able to cope better with computers, CAT scanners, medical instrumentation, bioassays, and biomedical engineering? The study of principles rather than the learning of facts is a more reliable and effective way of coping with new tools and techniques.

"If it is to be granted that a firm grounding in the principles of basic science is desirable, the undergraduate education should include courses which teach these principles. There is, however, no exact formula or list of courses which is unique in its ability to achieve these goals. Certainly calculus (preferably two years), physics with calculus, and physical chemistry are desirable. An improved program for the undergraduate preparation for medical school should strongly recommend these courses. There are some preference orderings which can be conveyed to students. Physical chemistry is preferable to biochemistry. Calculus is preferable to physiology. Physics with calculus is preferable to physics without calculus. Statistics or computer science is preferable to geology or astronomy. Although there is no magic list, the selection of courses chosen for the undergraduate degree can certainly be judged for rigor."

DAVIDSON COLLEGE

For Additional
Information, Contact: James M. Fredericksen, Ph.D.
Chairman, Premedical Program
Davidson College, Box 111
Davidson, NC 28036
(704) 892-2000 x308

A summary of responses from selected Davidson College faculty follows:

1. They feel faculty should require computer use for problem-solving courses in standard required science courses but that ability to communicate in some computer language should not be allowed to replace a foreign language requirement.

2. For a number of years Davidson has been increasing its emphasis on science concepts in introductory science courses.

3. They would like to see the MCAT include more conceptual questions.

4. They feel students should have broad exposure to the humanities and would recommend a better balance between pure science and the humanities with the inclusion of basic courses in philosophy and ethics.

5. A broad base in many disciplines in the liberal arts is important to develop reading skills. Quantitative analytical reasoning and problem solving are best developed in mathematics, chemistry, and physics courses.

6. The Davidson reactors disagreed with the AAMC assumption that faculties should balance responsibilities between formal and informal learning. Their view is that the nature of faculty-student relationships dictate that faculty maintain some distance from informality with students.

7. Stimulating students' curiosity and promoting intellectual drive are "difficult in the 1980s because students, especially premeds, are cautious, conservative, afraid, and will take few risks."

8. Faculty attitudes and behavior that stifle curiosity and intellectual drive are, "The Herr Dr. Professor and Great God Clinician" attitudes; being too busy; multiple choice tests; overfilled assignments and laboratory sessions that leave no time for anything else; and rigid lecture formats.

9. Poor teachers should not be permitted to teach students.

10. The best way for faculty to stimulate counterproductive competition among students is to put them on a curve for grades, where all the students know that their individual level of attainment is not measured against some objective standard, but merely against the achievement of their peers.

11. Peer pressure is an uncommon cause of counterproductive competition among students at Davidson. There is a spirit of cooperation and assistance, of sharing information, and, indeed, sometimes even of care for those who are not performing well.

12. An environment that permits justification of lying and cheating is one without an honor system of some sort, one in which such behavior is the common practice, one in which such behavior is not discussed in terms of its greater implications for behavior when people and their health are at stake. Such an environment is often present where the teaching/learning function of the institution is below other functions on the priority list, especially in its faculty attitudes and practices.

Finally, we quote verbatim the comments that relate to students and the concern for patients' welfare:

"We feel that consideration of this topic should rest primarily with the medical schools. We release many young, peach-fuzzed premedical students to the medical schools with their ideals largely intact and tempered with significant exposure to doctors, patients, and health care institutions. Concern for patients' welfare is high on the list of our graduates' reasons for wanting to practice medicine, and for many of them, this reason has been well explored and its meaning is pretty well developed. They are idealistic, but most of them are not naive. They are aware of the differences among themselves regarding what motivates them toward medicine and reasonably sophisticated in comparative self-assessment.

"Our sense of the medical experience, from both personal experience and many conversations with our students who have studied medicine, is that the concern for patients' welfare and the idealism that underlies that concern is lost by many students while in medical school. He runs into a variety of counterexperiences, and too few strengthening experiences there. We are not about to try to tell the medical faculties how to look at this problem or begin to rectify it. Many medical teachers do not see it as a problem, rather a desirable result."

FORDHAM COLLEGE

For Additional
Information, Contact: Sr. Monica J. Kevin, Ph.D.
Chairman of the Health Professions
Advisory Committee
Keating Hall 302
Fordham University
Bronx, NY 10458
(212) 579-2554

The Fordham College is a liberal arts college in the Jesuit tradition. Its curriculum is designed to develop the ability of clear critical thinking, and correct, forceful expression; it seeks to impart a knowledge of scientific principles and skills, an awareness of historical perspective, an understanding of the contemporary scene, and an intellectual appreciation of religious, philosophical, and moral values. Through concentration in a specific discipline, the curriculum strives to produce students who have read, reasoned, and written sufficiently in one or two disciplines to have been prepared for advanced work in those areas. Its recent curriculum revision (1980) has shown its belief that all students should undertake an integrated introductory liberal arts program while majoring in one of the sciences, humanities, or social sciences.

The Premed Program is an option, not a major. Although no specific major is dictated, most premeds major in biology, but in recent years the number of chemistry majors has increased.

Observations derived from discussions of the AAMC "Charges" booklet follow:

1. Communication between college faculty and their counterparts in medical schools, on a regular basis, would be helpful. While colleges are not simply offering service courses for medical schools, they would welcome comments on which information is known, unknown, or helpful.

2. Most college professors in their courses appear to stress concepts over information.

3. College faculty should have more input into the content of the MCAT. They suggest that more emphasis be placed on problem-solving ability and less on science knowledge.

4. Skills deemed to be assets in most professions are analytical reasoning, critical thinking, problem solving, rapid reading, independent study, etc. In addition, the medical student needs highly developed skills in communication (written and verbal) and expertise in coping with stress, in dealing and working with all kinds of people, in listening, and in exercising emotional control.

5. Personal traits desirable in physicians include self-confidence, integrity, emotional stability, self-understanding, ability to empathize, a sense of decency and caring, a willingness to serve and sacrifice. Intellectually the physician is expected to be alert, curious, observant, prudent, organized, capable of systematic problem-solving and independent thinking.

6. Faculty should take as active a role in informal learning as they do in stimulating formal learning. Fordham's faculty are encouraged to participate in student-faculty engagement outside the classroom setting. Cooperation between faculty in presenting ideas, literary and aesthetic experiences in informal settings offers convincing proof to students that intellectual skills, ideas, and values of the liberal arts professor are the materials of life and not just of the classroom. The ability to stimulate intellectual curiosity is the distinguishing characteristic of great teachers. Enthusiastic competent teaching must be rewarded equally with research.

A Fordham alumnus, about to graduate from one of the leading medical schools, commented on the present system: "The present requirements and climate force premeds to spend more time in labs than their liberal arts colleagues. To make matters worse, they feel compelled to retreat each summer to the local emergency room, research lab, or Kaplan tapes, in order to strengthen their application. The race to rack up hours in these pursuits is getting out of hand. In the quest of making the physician more aware of human needs it would be better to put the potential doctor more in touch with his classmates and routine life than with lab rats and erlenmeyer flasks furing his formative years."

The Fordham group concluded: "The importance of considering the total experience and performance of the student in the evaluation process cannot be overemphasized and it urges medical and undergraduate colleges to cooperate in designing an admission evaluation policy. It is our conviction that in order to measure the true intellectual vigor as well as the moral values and empathetic capacity of applicants, admissions procedures need to put greater weight on the areas of the student's record that require subjective evaluation. Every effort should be made to determine that the candidate possesses integrity as well as the potential to pass the National Boards. This mandates greater weight on subjective material in the application and places a serious responsibility upon advisers to establish credibility with the admissions officers."

HAMILTON COLLEGE

For Additional
Information, Contact: George E. Miller, M.D.
Director, Rudd Health Center
Hamilton College
Clinton, NY 13323
(315) 859-4111

The Hamilton College contribution to that component of the AAMC Project dealing with the preprofessional period of the medical education continuum was derived from four major sources: (1) informal reflection and discussion, by the Health Professions Advisory Committee, of assumptions cited in the "Charges to Working Groups"; (2) the responses of 49 faculty members and 19 premedical students to a questionnaire probing their views on key elements of those assumptions; (3) responses from 100 graduates (from the classes of 1969-1978) who had gone on to medical schools to a questionnaire that included an inquiry into their present views of the most important elements of a premedical education; 4) the deliberations of representatives from ten northeastern liberal arts colleges and nine medical schools who met on two occasions to discuss means of improving the quality, and decreasing some of the potentially disabling pressures, of premedical education.

Dr. George E. Miller concluded his report of the extensive efforts at Hamilton College with the following summary and synthesis:

"While it is impossible to ignore the impact of advancing technology, of changing social and economic pressures upon medical education and medical practice, and of persistent professional and institutional concerns for territory, the major issues in the preprofessional education of physicians seem more directly related to mixed messages that come to liberal arts college faculties and students from medical school catalogues and Admissions Committee practices. The resulting insecurity, or lack of trust, has a profound and disquieting effect upon the nature of undergraduate programs, and the atmosphere in which that undergraduate experience occurs.

"The central theme that appears to emerge from our inquiries and deliberations is perhaps best summarized in the introduction to a cooperative action proposal prepared after the second Hamilton Conference on Premedical Education:

> At the heart of the anxieties so pervasive among premedical students are the perception and belief that: (1) very high grades in premedical sciences and very high scores in the MCAT are required for admission to medical school; (2) other types of achievement count little unless they supplement an outstanding academic record and test scores; (3) admissions criteria and processes reward 'playing it safe' and penalize any risk-taking that detracts from high grade point average and MCAT scores; (4) alternative schedules of entry into medical school carry much higher risks than those associated with conventional, uninterrupted progress from college to professional school.

Those feelings stand in striking contrast to the equally widespread expressions from medical educators about the desirable, even essential, need for a broad liberal education before students enter the professional school. While definitions of the liberally educated person abound, and this is not the place to add another, nonetheless a common dimension of these definitions has been the desirability of balance among sometimes contending educational forces; personal growth and social awareness; familiarity with the social sciences, the humanities, and the natural sciences as well as concentration in a specific area of study. The attainment of this balance has been difficult in the best of times, but in the face of the pressures and anxieties noted above it is a concept that has been all but abandoned by many students planning careers in medicine. And the degree to which this view has been tacitly accepted by many liberal arts college faculties represents a challenge to one of their fundamental missions, and to the preparation of future physicians as well.

A credible response to this attitude might begin with acknowledgment of the great range and diversity of interests, needs, and qualifications represented in first year college students who have the potential to develop into clinicians, medical research workers, medical educators and administrators. Some enter college with a strong background in science and mathematics; others have had limited preparation. Some have had extensive contact with physicians and medical settings; others have had virtually none. Some have made a strong commitment to a career in medicine; for others this is one of several alternatives to be explored. The goal of medical schools and liberal arts colleges working together should be to value this diversity and to create the conditions that would permit each student to develop during the undergraduate years according to individual strengths and needs rather than by a procrustean myth of "what medical schools want."

Two present needs are: (1) to improve the communication between undergraduate colleges that send significant numbers of graduates into programs of medical studies, and the medical schools in which most of those graduates enroll; and (2) to provide a more effective counter to the undergraduate "grapevine" through effective communication of a program of options and alternatives that respond to the needs and circumstances of undergraduates who have career interests in medicine. A coherent structure and program that involves a significant number of undergraduate institutions and medical schools is essential if we are to move from platitudes to effective action.

"It was with these problems, opportunities, and needs in mind that the participating colleges and medical schools agreed to work toward a cooperative program aimed at: (1) increasing the credibility of already available, as well as new, options in academic preparation for medical school; (2) enhancing the liberal arts experience of premedical students; and (3) encouraging individualized programs of personal development for those students. Among the mechanisms being considered to achieve these goals are employment of more personal methods of assessing the qualifications of applicants, collaborative counseling of students considering a career in medicine, early assurance of admission to medical school to allow more varied education in the upper collegiate years, delayed matriculation to allow broadening of academic or nonacademic experience in the interval between college and medical school, and cooperative educational offerings between and among participating institutions.

"While none of these activities may seem especially novel, the creation of an atmosphere of mutual trust and understanding among a group of colleges and medical schools may make the options more widely believed and more generally accepted. Continuing communication among participating institutions should also provide a useful forum for exploring other problems and opportunities that are of concern to all, if the focus remains upon cooperative action, not merely the exchange of ideas."

HAVERFORD COLLEGE

For Additional
Information, Contact: Jenette Wheeler, M.D.
Premedical Adviser
Haverford, PA 19041
(215) 896-1151

For their participation in GPEP, Haverford College organized the Cadbury Conference. It was an excellent two days of interaction and idea sharing between students, faculty, and 22 alumni in diverse medical careers. Misconceptions were dispelled and interesting recommendations for Haverford discussed. We agree with Dr. Swanson that the most effective part of GPEP Study is giving people involved the chance to have focussed communication. Thanks for the stimulus.

Our background was some preliminary data from an interesting 7 college Macy supported student survey they've been part of, following students from college entrance to medical school. The study is beginning to define in numbers what most know already who work with premedical students. On entrance they are already the most highly motivated and highest high school achievers but also have the greatest concern that their grades won't be high enough to get them into professional school (a concern twice that of other groups). More hours are spent in class and preparing for class, with more tests and finals, very few term papers. 53% claim that a substantial number of other students have negative attitudes towards others of their career preference (twice that of other career groups). By Senior Year, the persisters (50% of the originals actually applied) were distinctive from non-persisters in their high desire to help others and lower interest in financial security and status. One quarter of applicants had not signed up as being premed as freshmen.

At the GPEP Conference we had an intensive look at the growing experience of a future physician going through Haverford. Concensus was that it was good - that the total experience of a liberal arts education prepared one best for the myriad of professional responsibilities physicians face. Haverford's dimension point system is one way to ensure academic breadth while maintaining the important ingredient of CHOICE. Analytic thinking is stressed over basic memorization. Cooperative creative effort occurs in the science laboratories. Small seminars in the major subjects stimulate growth in listening skills, oral communication, and critical literature review. At the heart are the high academic and ethical standards of the faculty and their personal concern for students. Good teaching is rewarded. Basic is the sense of Quaker community and the social Honor Code.

Distortions in this college growing experience exist! from pressures real or perceived of what medical school admissions committees want. Is there anything that might be done to lower the negative stresses and encourage personal growth?

One intrusion is the necessity to do well on the MCAT exam, the science-oriented test with specific subject items to be mastered in Biology, Chemistry, and Physics. Most students are pressured into taking all four science requirements early in college, taking the MCAT test in the spring of Junior Year. This means preparing for it while they should be getting enmeshed in their major subject and having the chance to do more independent thinking in a concentrated field. (and it is well publicized that the MCAT is an achievement test!)

What options exist to relieve some of the unproductive stress?

1. Placing less importance on very high numbers in the admissions process (difficult to achieve).

2. Measuring only analytic ability (i.e. deleting the Biology, Chemistry, Physics sub-tests).

3. Giving a choice of one or two of the first three memorization-oriented tests so that a student could have more flexibility in the timing of his basic science courses and could plan to take the test at the end of the sophomore year.

4. Including a written essay as part of the day of testing as a signal to the student that writing and organizing thoughts are also important skills.

On the other hand, how can the admissions system encourage growth in the personal skills not measurable by NUMBERS. The bottom line is in who gets admitted and who gets rejected. When students see the medical schools accepting their peers which are the most deserving, both academically and personally, the grapevine will encourage personal growth better than any admissions requirement. How do admissions committees better evaluate nonnumerical qualities? The letter of recommendation from a trusted premedical adviser or committee should give the committee their best picture of the applicant's personal strengths - contingent on how well the admissions evaluator knows the writer. More interaction between the two sides, with advisers meeting with admissions deans and discussing individual applicants and medical students would help the process. The adviser then can speak to students with greater confidence, greatly reduce nonproductive stress caused by misinformation and encourage the fearful student to get out of the library and develop more interpersonal skills. The knowledge that generally trustworthy information on medical school admissions criteria is available at the premed office has a great effect on reducing stress for grades and on development of less measurable skills.

Haverford enthusiastically recommends increased frank communication between medical school admissions officers and undergraduate colleges and preservation of a broad liberal arts education as an excellent foundation for becoming a modern physician.

HUNTER COLLEGE

For additional
information, contact: Irwin Oreskes, Ph.D., or Thelma Carter, Ph.D.
Professor of Medical Laboratory Sciences
School of Health Sciences
Hunter College
425 East 25th Street
New York, N Y 10010
(212) 481-5115,

The question of how best to prepare students for medical school has been the subject of much debate and some experimentation for many years. The Hunter program described its experiences of the past decade in educating a largely urban minority and economically poor student population for the profession of medical technology and derivative results in premedical education.

During the late 1960s, the City University of New York responded to federal forecasts anticipating shortages of trained medical laboratory personnel in the coming decade, by authorizing establishment of a baccalaureate program in medical laboratory sciences to be housed at Hunter College. Among its objectives were to offer new educational opportunities in the health sciences to qualified New York high school graduates, to develop a program that would meet local needs for qualified laboratory personnel, and to permit nonbaccalaureate laboratory personnel to earn the bachelors degree in science. Their goal was to educate laboratory workers who understood the theoretical science behind the methodology, who could readily learn current methods, evaluate old ones, and, in time, develop new ones. Moreover, such students, when offered the opportunity to climb "career ladders," would be better equipped to do so.

Applicants to the program were required to have completed the first two undergraduate years, including one year of general chemistry and biology, and one semester of college level mathematics. The medical laboratory sciences curriculum was planned to be taken in undergraduate years 3 and 4 and included two semesters of clinical biochemistry, and clinical microbiology and one semester of instrumental analysis, pathology, physics, organic chemistry, laboratory data processing, computer science, and immunology. The latter three courses, innovative at the outset, are now to be found in the curricula of nearly all medical technology programs. Students were offered departmental electives in virology, parasitology, histology, and mycology and advanced analytic techniques. They were also encouraged to take as electives, in other departments, genetics, biostatistics, molecular biology, and additional organic chemistry or physics. All courses included a required laboratory component. To make room for these courses the traditional hospital internship was shortened. In many respects the theoretical content of the various courses was similar to those in the traditional medical school pre-clinical years but presented at a more leisurely pace and with some modifications of the undergraduate courses to accommodate Hunter's students. It should be noted that the program was not designed to appeal or to recruit typical pre-medical candidates at Hunter College. Most students transferred from community colleges with an immediate career goal, medical technology in mind. Some 40% of the students were black or hispanic, a similar figure to that for Hunter College at large. However most entering students were adequately prepared to do the academic work and attrition was about 10% or less.

This summary was drawn from testimony presented by Dr. Irwin Oreskes at the AAMC Northeastern Regional Hearings held May 5-6, 1983.

The results were as follows. Significant numbers of students, as they achieved success in the program became more and more confident in their abilities and raised the sights of their ambition. They began to apply for admission to medical or other professional schools or to Ph.D. programs. During a ten year period, from 1972 to 1982, 15 percent or 38 of 255 of their B.S. graduates were admitted to medical, dental, podiatric or graduate schools. Fourteen different medical schools, including Harvard, New York University, Temple and Kentucky, accepted at least one student. Cornell and Buffalo took two; SUNY-Downstate and Johns Hopkins took 3; Einstein took 5. Few students who applied were rejected and many had multiple acceptances. The acceptees were 63 percent black or hispanic and 47 percent were women, figures of some interest to those who believe that new ways must be found to stimulate education of minority and female physicians. Nearly all who were accepted successfully completed their course of study.

Frequently qualified students from disadvantaged backgrounds are practically and psychologically unable to stake their futures on the long admission odds that have characterized the conventional premedical track. Their educational goals and efforts need to be directed toward more immediately obtainable objectives. These students are well aware that most typical premedical students do not achieve medical school admission and that their education may have limited value in today's job market. But by achieving a short-term success, which includes the development of useful job skills, these students become ready to take the next step.

The programs faculty also raised questions about the validity of classical premedical preparation as often encountered in Biology Departments. The fierce competition for grades that characterize students as they take their courses coupled with the fear of non-acceptance at medical school with no career alternative in sight at the end of four years of effort surely presses middle class as well as disadvantaged students. Alternatively attainment of a multi-purpose education, resulting in a terminal degree in a useful profession and also translatable into higher professional preparation, offers all students time for maturation and allows for the development of the courage and resolve to pursue alternate career paths in a sensible and secure way.

It is their conviction that a science-based baccalaureate program provides the intellectual training required for in the practice of the profession of medicine. They do not accept the notion that production of caring physicians can be achieved by curricular tinkering. Rather the practice of useful work and participation in "real" life can do more to cultivate caring physicians than additional courses dealing with idealized and abstract human issues and values. They argue that there are many routes that combine useful short-term educational goals with premedical or other preprofessional education. They have come to understand as did Booker T. Washington that "practical" and "higher" education can be combined to the mutual benefit of each. The challenge facing undergraduate and medical educators is to chart such combinations.

IOWA STATE UNIVERSITY

For Additional
Information, Contact: Jean D. Lassila, Ph.D.
Preprofessional Adviser, Human Health Services
College of Sciences and Humanities
201 Carver Hall
Ames, IA 50011
(515) 294-8300

Participants who discussed issues defined in their project included members of the Administrative Advisory Committee for Preprofessional Health Studies, premedical advisers, and Premed Club. Comments from their discussion of the issues in the "Charges" booklet follow.

1. Identification of essential knowledge to be acquired by students could be accomplished by asking practicing physicians what parts of their education were essential.

2. Independent undergraduate research with a faculty member encourages independent thinking and introduces the student to research methods. Medical school admission requirements for general and organic chemistry, mathematics, introductory physics, and introductory biology should not be changed. Furthermore, it has been found at Iowa State University that students' problems with mathematics frequently arise from inadequate basic reading skills. Basic English skills are certainly essential to the study of the biomedical sciences.

3. Students say that perhaps 95% of the teaching in their courses have been of facts rather than concepts but that laboratory courses are better for teaching concepts than are lectures. They want more opportunities to reason through problems rather than memorize information.

4. Both faculty and students felt that the MCAT scores should be a factor in medical school selection, but they believe students' undergraduate grades constitute a better evaluation of their ability. Return of "general knowledge" that would validly measure students' knowledge in the humanities was supported.

5. Iowa State University offers courses that provide a broad educational base for students going on to medical school and prefers a four-year preparation for medicine. Most departments in the College of Sciences and Humanities require three semesters of English Composition.

6. First-year medical students in groups should be exposed to suffering from illness, grief, or fear by watching interviews through one-way mirrors.

7. Courses recommended to develop skills in reading, analytic reasoning, and problem solving were English literature, logic, statistics, organic chemistry, independent scientific research, and auto mechanics--a course that develops skill in diagnosis and problem solving.

8. Instructors may facilitate development of skills in analysis and criticism by presenting challengable theories as they teach--even deliberately and carefully making erroneous statements in their lectures to encourage criticism.

9. Informal learning can be fostered by faculty as advisers and if individual departments provide places for students and instructors to gather, they can exchange ideas with one another.

The members felt that the competitive aspect of preparing for admission to medical school hinders the development of informal learning, and the development of personal qualities--that the present competitive attitude is destructive for faculty and students. The system fosters memory work and the students become less and less open to independent learning. One suggestion was that admission to medical school be granted during the summer after the sophomore year but entrance then deferred until after the senior year. Those who are not admitted can go on with some other goal in mind, and those who have been admitted can concentrate on learning. Their questions should be encouraged and answered in an atmosphere that is conducive to their participation. Small recitation sections for large lecture courses at Iowa State provide opportunities for such questions.

Faculty can lessen the stress from courses by telling students in advance what the grading criteria will be, how to study, and what will be expected of them. Course outlines given students in most classes at Iowa State at the beginning of each semester usually contain such information.

The counseling personnel at a university can hold workshops and individual sessions for students who need help in learning to deal with stress. They have such counseling here. If students with impaired coping mechanisms are identified, faculty should advise them to seek the help that is available at most universities. If the problem persists, faculty members should discourage the student from applying to medical school and should include the pertinent facts in letters of recommendation.

UNIVERSITY OF KANSAS

For Additional
Information, Contact: William M Balfour, Ph.D.
Professor of Physiology
University of Kansas
Lawrence, KS 66044
(913) 564-4021

The University of Kansas premedical deliberating group, consisting of faculty, premedical students, and first and second-year medical students, cited three institutional concerns:

1. The increased essential knowledge and fundamental skills required for medical school admission as exemplified by the present MCAT are major concerns. This is particularly true in biology where separate courses in physiology, genetics, and cell structure and function are necessary unless a biology course for premeds is given (which they feel would be a mistake). A required (or highly recommended, which, they point out, is the same thing) computer science course seems inevitable. At the same time more humanities and social sciences are needed to help develop other skills and to aid in the development of the personal qualities, values, and attitudes so important to a good citizen and physician. Perhaps five years will eventually be necessary for the premed plus liberal arts education.

2. Emphasis on grade point averages in selection is another major concern. Some premeds avoid honor classes because of the risk of a B where an A would be earned in the regular course. The same is true of exploring unfamiliar areas and this may be reflected in intolerance or suspicion of new ideas.

3. The shrinking pool of applicants for medical schools is another concern. Many causes undoubtedly contribute, but more frequently the above are cited as reasons. Also, the "ebbing mystique of the physician" is probably a factor, as well as the increasing cost of medical school.

The following modifications in educational strategies were reported:

1. New majors have been established to address in part concerns about the narrowness of the usual premed major in biology or hard sciences. A human biology major was instituted at the University of Kansas about 5 years ago. It has worked well for prehealth science curricula requiring a baccalaureate degree. In addition to the usual premed requirements, courses in psychology, physical anthropology, and genetics are required. Elective courses are taken in each of 6 areas: Evolution/anatomy, systemic physiology, behavior/learning, growth/development, molecular biology, and microbiology. A senior seminar with oral presentations on library research topics is required. Furthermore, a group of courses offered as a second major designed for anyone in the liberal arts is called Social and Humanistic Studies in Health. It includes courses related to health topics in sociology, philosophy, economics, and human development. It is hoped that this new major will appeal to premedical students, as well as others, as part of their liberal arts education.

2. Small discussion classes, research seminars, and informal faculty-student contacts are frequently mentioned by respondents as necessary for the development of values, attitudes, and personal qualities. The Kansas respondents report,

however, that they are moving to larger classes--most reluctantly--because of financial restraints.

3. The division of student affairs is studying in depth the reasons why students drop out of school and will give special attention to the reasons premed students give.

UNIVERSITY OF MICHIGAN

For Additional
Information, Contact: Nicholas H. Steneck, Ph.D.
Associate Professor of History
4638 Haven Hall
Ann Arbor, MI 48109
(313) 763-2230

Eleven years ago the University of Michigan instituted an experimental medical training program that enabled students to attain both the undergraduate and medical degree during seven years of integrated liberal flexible education. The Inteflex Program is the product of joint liberal arts and medical school planning. Its goals can be summarized as follows:

1. To make medical education more efficient;

2. To eliminate the pressure of medical school admission in the hope that students could take the liberal arts/humanities components of their education more seriously;

3. To create opportunities for students with diverse backgrounds and wide interests to pursue a flexible medical program; and

4. To experiment with curriculum development in an effort to develop better ways to deliver required subject matter.

To one extent or another each of these goals has proven attainable. Some of the problems encountered would be those likely to arise when implementing reforms in medical education:

1. Cost in personnel. In the early 1970s, when this innovation began, both the state and federal government were fortunately seeking to expand and improve medical education. Michigan no longer has excess funds for experimentation and education, nor even enough to maintain all existing programs. During times of retrenchment, small experimental programs become obvious targets for economizing. The main lesson to be learned here is that costs cannot be separated from reform. Any recommendations the AAMC project panel makes for curricular reform must be accompanied by sober appraisals of how they are to be accomplished.

2. National Boards and grade point averages. The limits of innovation are now rigidly fixed by the standards that have to be met on the way to the M.D. degree. Whatever goals were set for Inteflex students, they still have to perform well on National Boards and maintain high GPAs. Faculty have been conditioned to believe that GPAs and Board scores are measures of the quality of future physicians. When Inteflex students reach the equivalent of M-1 year with less than the 3.5 GPA for admission to our medical school, or get slightly lower scores on National Boards, this is taken as a sign of weakness.

Whether lower GPAs or National Board scores do actually predict physician quality may be subject to question. In the case of Inteflex students, much of the differences can be categorized by the fact that students are encouraged to

---

This summary was drawn from testimony presented by Dr. Nicholas H. Steneck at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

take difficult advanced humanities and social science courses, or that the need for As in organic chemistry is not stressed, but traditional standards cannot be deemphasized too much.

The conclusion that follows is that medical education can be changed only if the reward system is changed. As long as GPAs and National Boards are used as major measures of success, all planning and innovation will be forced to adhere to these measures; as long as students have to have high GPAs to get into medical school, experimentation in the liberal arts would be limited. Students will always perform in accordance with the standards they have to meet. To change how students perform, one must begin by changing the standards.

3. Basic sciences versus the clinical phase. Early admission provides a unique opportunity to admit students into medical school who might not survive the grueling premedical experience; but freedom to track different types of students into medicine through early admissions is, again, severely limited by the standards met along the way. Students who enter the Inteflex program with weak high school backgrounds will have a difficult time competing, no matter how bright they are. The courses that usually separate successful from unsuccessful students are the basic science courses, a pattern that probably closely mirrors the standard premedical experience. The ability to perform well in basic sciences is, therefore, ranked high as a primary criterion for admission. The assumption is that the ability to perform well in basic sciences is a legitimate measure of the quality physician. The experience in this program suggests that this assumption may not be correct. Inteflex students do not perform as well as their standard program counterparts during the basic sciences phase of the program, but they outperform them during the clinical rotations, getting a higher percentage of honors even though they are two years younger. Scientific competency is obviously an important part of becoming a physician. However, scientific competency, if overemphasized, may be a quality that is purchased at the expense of other qualities.

It is probably the case that some of the Inteflex students who perform well during clinical rotations would not have made it into medical school through the standard route because they could not get As in chemistry and physics. If this pattern were true on a national scale, it would follow that deemphasizing the stress put on science at both the premedical and basic sciences stages would alter the characteristics of the M.D. being graduated. If general change of the science requirements is, in major or minor ways, thought to be too radical a step, at the very least, it might be worth considering tracking students at a much earlier stage into primary care versus research programs.

4. Professionalization. As mentioned at the outset, one goal of Inteflex has been to remove the pressures created by post-B.S.-degree admission into medical school, thereby giving students the opportunity to take their liberal arts experience more seriously.

However, try as we might, it is impossible to remove all pressures. The Inteflex students still strive to achieve well beyond the minimum requirements for success. The main reason for this remains the fact that medicine is a high prestige profession that rewards aggressive, competitive behavior. Changes in medical education cannot be effective without taking into account costs, basic achievement standards, and fundamental orientations. The overall tenor of medical education cannot be changed as long as it remains the battle ground on which armies of would-be professionals fight for admission to one of the most coveted positions in our society. If this assertion is correct, then it follows that one final important goal of any changes ought to be the democratization of medical education at the expense of elitism. The opportunities to pursue medical education should be expanded, not unnecessarily restricted. The elite status of specialization should be deemphasized. Physicians and paramedicals should be brought closer together. Every effort must be made to ensure that the opportunity to pursue a medical education is open to all. If the fundamental problem of exaggerated professionalism and its root social causes could be mitigated, medical education would become much more humane. At the very least, a lessening of professional pressures would make life a little easier for those who work with the humanities component of medical education.

MONTANA STATE UNIVERSITY

For Additional
Information, Contact: Stuart E. Knapp, Ph.D.
Vice President for Academic Affairs
Rm. 211, Montana Hall
Montana State University
Bozeman, MT 59717
(406) 994-4371

A committee of faculty was appointed to conduct this study. It developed four separate questionnaires, which were sent to or discussed with physicians practicing medicine in Montana, premedical students, alumni in the third and fourth years of medical school, and MSU faculty. Summarized results of the questionnaires served as the basis for discussions by the faculty committee. The following observations are drawn from those discussions.

1. Educational programs generally are not oriented toward teaching and learning of skills in problem solving.

2. Communication skills generally are not developed during undergraduate education.

3. The MSU premedical undergraduate curricula provide an experience which is the shortest means to the end of gaining entrance to medical school and passing medical school.

4. Medical schools and premedical programs tend to promote the "fear of failing" syndrome.

5. In premedical programs, inadequate opportunities are provided for independent learning due to the overburden of required courses.

6. Premedical programs do not encourage students to take courses in the social sciences and humanities.

Faculty discussed a number of minor educational modifications that they deemed desirable and whose implementation they felt would pose little difficulty.

1. Encourage third and fourth year premedical students to take "senior" research projects to develop skills in independent learning, investigation, and writing.

2. Encourage more student-faculty personal interactions.

3. Encourage students interested in medical school to participate in the Honors Program offered by the university.

4. Define methods/courses to improve the problem-solving skills in premedical students.

5. Halt the progression toward the "spoon-feeding" syndrome in the basic science years of medicine.

6. Develop "role models" between medical students and premedical students within the same institution.

7. Improve medical school courses in the basic science years by avoiding the "parade of stars" (experts) problems that tend to lead to poor course organization, poor teaching, and poor learning. The "common thread" should be provided for every course, while avoiding the "second grade" educational atmosphere for medical students.

8. Encourage premedical students to take more courses in the humanities and social sciences. Develop strategies to improve the interest of these courses for prehealth professional students.

9. Encourage faculty to develop testing strategies that will promote the development and maintenance of writing and problem-solving skills.

10. Encourage self-paced learning and independent study throughout medical school as a viable system of education and as a means of establishing habits of life-long learning.

Results of responses to the questionnaires follow:

The undergraduate science courses viewed most important were chemistry, comparative anatomy, embryology (by M.D.s graduated before 1966), and anatomy and physiology (by younger graduates). The older physician's found foreign languages least important and the younger physicians, chemistry. When asked about undergraduate courses that required nonessential memorization without conceptual learning, 73 percent named chemistry.

Seventy-three percent of the physicians found science requirements for entrance into medical school adequate. Another 18 percent agreed with some minor qualifications. Most physicians indicated that college preparation should include courses such as philosophy, ethics, arts, humanities, and psychology.

The majority of the physicians felt that the emphasis placed on GPA, MCAT, and interviews by medical school admissions committees was appropriate. Medical school courses they found most important in preparation for their clinical years were anatomy, physiology, and pathology. Most thought the National Boards a reasonable method of evaluation. One half felt more preventive medicine in the curriculum would have been useful as well as some background in business management and behavioral and counseling skills. They also seemed to feel that a closer faculty-student relationship would help decrease stress. The aspect of their education that most promoted their concern for patients was good role models. Faculty attitudes that they mentioned most often as stifling curiosity were faculty aloofness, inaccessibility, work overload, hostility, impersonal attitudes, pickiness, and unwillingness to put their courses in perspective.

Medical students in this poll were in unanimous agreement that premedical education does not provide sufficient exposure to social, economic, and political issues that would be helpful to them. Likewise, they found their biomedical science knowledge necessary for their clinical years in medical school. They favored courses that emphasized conceptual learning, those that utilized small group discussions, and those that encourage development of independent learning skills.

MONTANA STATE PAGE THREE

The majority of the premedical students thought their choice of science as an undergraduate major was important to their acceptance into medical school. Most of them had favorable comments about the MCAT and the necessity of having it as a "national standard" for screening applicants for medical school. Several commented that it might include questions in the humanities and social sciences and have more emphasis on problem solving. The majority (67 percent) felt a year out between college and medical school would be a valuable "people experience" and chance to mature. The majority thought medical school entrance requirements were adequate but that there should probably be a specific requirement for more humanities and social sciences.

POMONA COLLEGE

For Additional
Information, Contact: Richard A. Fass, Ph.D.
Vice President and Dean of Students
Sumner Hall 101
Pomona College
Claremont, CA 91711
(714) 621-8017

The Medical Sciences Committee at Pomona College is the faculty group with primary responsibility for monitoring and evaluating the performance of premedical students. Much of the discussion focussed on suggestions for improving or expanding the functions of that committee.

Major institutional concerns that faculty, premedical advisers, and premedical students covered included the following:

1. Approximately one half of those entering Pomona intending to pursue a premedical track abandon those plans before their senior years. A number of issues here warrant further study because of the impact of these changes on the college as a whole.

2. Unhealthy competition and debilitating stress by premedical students are apparently less prevalent at Pomona than elsewhere. Nevertheless, ways that such problems might be abated further were discussed.

3. There was a great deal of concern about the effects of the perceived preferences of medical schools on the academic and extracurricular choices made by students during their undergraduate college years. It was noted that any attempts to counteract these effects are complicated by the mixed signals often generated by medical schools about the qualities that are important for gaining admission.

4. The group discussed problems involved in trying to assess or improve premedical students' interpersonal skills because of the group's conviction that those skills contribute to effective empathetic patient care and effective working relations with other physicians.

The context for discussions about institutional strategies for addressing these concerns was a deep and continuous commitment to liberal education and a belief that this is the best possible preparation for most professional careers. In their view, few measures were unique to preparation of students for careers in medicine, except for the requirement for a strong basic science preparation. Strategies discussed are keyed to the above stated concerns:

1. Several students suggested that a student support organization for premedical students would provide a mechanism for students who encounter difficulties or self-doubts during their early years. Efforts will be made next year to revive interest in such an organization among premedical students.

2. In discussions about the level of stress implicit in their premedical program, one faculty member asserted that "We select students who respond to stress intellectually, rather than emotionally. This is the wrong kind of training for real life as a physician." Whether or not this description of their admissions process is accurate, it is nevertheless true, as another faculty member stated,

that "we teach students to be students, and do not force them to take care of other personal needs." This led them to a discussion of the desirability and/or the feasibility of establishing programs for enhancing the social skills of premedical students.

It would be helpful if medical schools would require that premedical students include a course in their curriculum dealing with interpersonal relations. Courses in interviewing techniques or counseling skills, or courses that include major field interview exercises in sociology, psychology, or anthropology are just a few examples. Furthermore, there should be a requirement of some form of active participation in sports, performance, or other group-oriented activites.

Given the stressful nature of medical school and medical internships and residencies, it may be that the premedical program is a reasonable preparation for a medical career in that it is good preparation for survival under stress. Nevertheless, it would be desirable to monitor this stress carefully and be prepared to take steps to help students to cope more effectively with this stress if and when it becomes harmful or self-defeating.

3. It is still the perception of many students that any diversion from their effort to achieve the highest possible grades will significantly hurt their chances of being admitted to a medical school. If the statements about the value medical schools place on nonacademic achievement and participation are serious, then changes must be made in the medical school admission procedures to reflect these priorities.

4. The Pomona faculty Task Force agreed that much could be done to give more attention and emphasis to the human relations skills so important for physicians who provide direct care to patients and their families. Their dilemma was that the conventional measure of setting up an academic course to deal with these newly defined issues seemed neither appropriate nor effective for achieving the objective of improving the skills in undergraduate students. Indeed, one faculty member expressed the view that it was futile to try to improve these skills in undergraduates, and that it would be better to "select people who have compassion rather than teaching people who don't." While most would not subscribe to this view in the extreme, it was agreed that the Medical Sciences Committee could give more attention to these qualities in its advising and in the formulation of its letters of recommendation.

The Task Force also agreed that the most effective way of measuring these interpersonal skills in students was to observe or receive evaluations of the performance of students in activities or programs that require close cooperation with other students. Team laboratory projects, tutoring, student government, peer advising, and other similar situations should provide an opportunity to identify those students with the most promise as sensitive, empathetic physicians.

SIMON FRASER UNIVERSITY

For Additional
Information, Contact: B. A. McKeown, Ph.D.
Professor of Biological Sciences and
Director, Animal Care Facilities
Department of Biological Sciences
Simon Fraser University
Burnaby, B.C. Canada V5A 1S6
(604) 291-3538/3691

Simon Fraser University (SFU) is a postsecondary institution in Burnaby, British Columbia, Canada. It has about 11,000 students. Their students apply to enter the Faculty of Medicine at the University of British Columbia (UBC) and other university medical schools. On the average, about two dozen students apply to UBC and a high percentage are successful applicants. The author of the report sits on the medical admission committee at UBC as SFU's representative and is involved with the SFU academic advice center to advise students on science academic problems, including medicine.

Insights and practices reported include the following:

1. Use of MCAT scores by admission committee. Each individual uses the MCAT scores differently. Most assessors look first at the scores obtained on course grades and second at the MCAT scores. In cases where course grades have been up and down or display some other problem, then the MCAT scores are viewed more closely.

2. A broad education in college. A broad education for a medical school applicant is desirable but due to the course program the student has chosen, there may be little room for many electives. Then an evaluation of the student's interests, hobbies, and avocations becomes important.

3. Development of critical skills. SFU faculty encourage the development of critical skills, especially in the sciences.

4. Balance of formal versus informal learning. Education at SFU is almost entirely of a formal nature.

5. Stimulation of student's curiosity. Faculty at SFU encourage students to be curious and show intellectual drive. The audio/visual self-learning and tutorial system encourages this attitude. The students' peers influence their being open to new ideas. To encourage students' intellectual drive, faculty must have good rapport with them and accept criticism.

6. Promoting healthy competition. Faculties should reward students for hard and good work. Faculty must be constructive in criticism. Peer pressure is a minor cause of counterproductive competition.

SMITH COLLEGE

For Additional
Information, Contact: Margaret Olivo, Ph.D.
Associate Professor
Department of Biological Sciences
Northampton, MA 01063
(413) 584-2700, x580

This report represents the views of faculty at Smith College in the sciences and humanities, members of the the Smith Career Development Office who counsel students considering medicine as a career, alumnae of Smith classes of 1977 and 1978 who have attended medical schools, and present undergraduate students.

1. Value of basic science. It was agreed that basic education in the sciences at the undergraduate level is required to prepare premedical students for medical school. However, by requiring two years of chemistry and one year each of biology and physics, medical schools contribute to the already strong tendency for students to pursue a major in the sciences. This combination of courses is the backbone of both the Biochemistry and Biology majors at Smith. Further, the perception at Smith is that completing a science major may be important both in getting admitted to medical school and in learning the basic biomedical material offered in the first two years of medical school. Also, by requiring a program of courses that, in a liberal arts college, requires three years to achieve, the premedical undergraduate is set extremely early in her education on a rigid pathway which permits little experimentation with her curriculum in the humanities.

2. Identifying the essential knowledge to be gained from required courses. A straight-forward approach is to compare the knowledge needed and used by physicians to the content of required courses. For example, a typical Organic Chemistry textbook emphasizes industrial applications of reactions, plastic polymers, etc. If this knowledge is of use to medical doctors, requiring a year of Organic Chemistry as part of the premedical training is appropriate. If such knowledge is not appropriate, replacing the requirement with one semester of basic biochemistry would be better.

The assumption that the MCAT provides a standard to assess the adequacy of preparation of students was vehemently opposed, especially by the alumnae who attended medical school. Instead, it was agreed that the MCAT assesses the ability of a student to take standardized tests. Nevertheless, it is perceived that high scores are required for the serious consideration of a given application.

3. Independent learning. Undergraduate students, as well as medical students should be urged to learn skills that support independent learning. Listed below are four examples of educational strategies that might used, with appropriate adaptations, to stimulate students' curiosity, intellectual drive, and independent learning in either undergraduate or medical education:

(1) Laboratory exercises and lecture material should be well coordinated so that concepts are synergistically reinforced. Although not possible at the undergraduate level, medical schools might consider coordinating simultaneous courses,, for example, anatomy and physiology.

(2) Assignments should be made that are interesting and relevant and require problem-solving techniques. For example, at a level appropriate for the student, describe a patient with a given set of symptoms and ask the student to identify the clinical problem and its anatomical/physiological basis. Such questions in the first two years of medical school may support not only independent learning but also the students' need to find relevance in the initial biomedical training.

(3) Original papers can be read and then discussed in detail. Once a student has mastered a paper in depth, she has developed a contextual background that is meaningful and that will provide a framework for future learning; she has critically analyzed information and considered its interpretation and significance. Through such a process, students quickly develop analytical skills that can be adapted easily to new situations of learning.

(4) Rhetorically pose integrative and synthetic questions at the beginning of a course. Return to these questions at intervals during the course and use information recently learned by the students to support integrative concepts.

4. Suggestions for meeting challenges, working with others, and working hard:

(1) Assignments can be made of individual projects or papers that must be met in steps. This encourages cumulative, thoughtful work, because each individual component of the assignment is a small step. At each step, in a brief student-faculty conference, the student receives feedback.

(2) Assignments can be made that require teamwork, e.g., group library research projects for seminar courses of laboratory projects.

(3) Criterion-based learning can be used in certain types of courses. Students are told the level of competence they must achieve to earn a given grade. Such a system eliminates ranking of students; it therefore promotes students working together because they know that they all have the opportunity to earn an excellent grade.

5. A request for clarification. At the present time, premedical students are faced not only with extensive curricular requirements (which vary in emphasis from medical school to medical school) but also with additional unwritten requirements, such as significant experience in the field of health care. When students don't know what is expected, they do everything that might be expected to ensure admission to medical school. If admissions committees would coordinate curricular requirements and make their unwritten requirements explicit, premedical students would be sensible in their choice of courses and extracurricular activities. Once free of the preoccupation with strategies for gaining admission, students may choose more courses in the humanities and the social sciences out of genuine interest.

UNIVERSITY OF TEXAS, AUSTIN

For Additional
Information, Contact: Jeanne M. Lagowski, Ph.D.
Associate Dean
GRG 234, AC 512
College of Natural Sciences
Austin, TX 78712
(512) 471-3172

Although the most visible functions of undergraduate premedical advisers are counseling and advising students preparing for medical school, these are not their only functions. Typically the premedical adviser works with students interested in a variety of health careers, not just medicine. Further, the undergraduate years are a time of reassessment of abilities, interests, and goals. Much of an adviser's time and effort is spent trying to provide concerned--but realistic--counseling for those who do not appear academically competitive and helping students define and redefine their interests and career goals. To illustrate the magnitude of this advising role, on this campus about 50% of the students who enter college as premeds change their career direction by the end of their sophomore year. Their exit from the program is compensated, at least in part, by transfer students and those who become committed to medicine later in their academic careers. If one realizes the extent of the turnover and winnowing that goes on during the undergraduate years, perhaps the tendency of faculty and advisers to rate medical school applicants high on scales designed to "compare (them) with other students of the same level" is more understandable.

The high loss of premedical students during the first two years of college appears to be closely related to a fear of and/or poor performance in science and mathematics courses. Students want to memorize rather than conceptualize; their analytical thinking and problem-solving skills are weak. This is not to say that these students aren't intelligent, but rather that they haven't been encouraged to develop these basic skills. (Many educators feel that this situation will get worse before it gets better because of the alarming deterioration of precollege science education.) Science faculty consider math, physics, and chemistry to be subjects that foster the learning and development of these kinds of intellectual skills. Students, on the other hand, view these very subjects--and the teachers--as hurdles and obstacles to prevent them from getting into medical school. They abhor labs and consider them tedious and too time-consuming. They don't see the relevance of physics, in particular, to the study of medicine. If these higher-level thinking skills are indeed important to the study and practice of medicine, changes in the minimum science requirements for admission to medical school should not be made without thoughtful consideration of the intellectual characteristics of the students who are screened out by these courses.

The biological sciences are perceived as relevant, but many students feel that one year of freshman biology does not provide adequate preparation for the MCAT. Biological science faculty, on the other hand, tend to think this is more a matter of the intellectual maturity with which students approach freshman biology. In general, freshmen are not very mature students.

The whole premedical experience is predicated on grades. Students shy away from courses and teachers known to be difficult, regardless of their potential intellectual value. They are reluctant to explore new areas. In short, they are afraid to do anything that might jeopardize their grade point averages (GPAs). In many instances students admit to weaknesses, e.g., in communication skills, but they are afraid to take courses in these areas because they might not get a "good grade," i.e., an "A." Rather, they want to take courses they think will be: easiest for them and/or sure A's; relevant (e.g., histology, anatomy, physiology); and/or of value because they have been told by medical students and physicians that they will "make medical school a lot easier." Advice from a physician or someone associated with a medical school, however outdated, inaccurate, or inappropriate it may be given the student's academic record, is invariably held to be "better" than their premedical advisers'. This kind of informal advising is difficult for advisers to cope with, and solutions are not obvious.

Students are also reluctant to broaden out and take courses in the humanities because they can't see their relevance and they are insecure about taking courses in which the grading is highly subjective. The MCAT itself, the coursework specifically required for admission to medical school, the use of computer programs to screen out applicants on the basis of MCAT scores and GPAs, and students' perceptions of their peers who are invited to interviews, as well as those who are accepted first, are not in accord with the medical schools' expression of interest in well-rounded applicants. If well-rounded, broadly-educated students are an important constituency in the applicant pool, medical schools and advisers must work together in such a way that students--and indeed advisers--don't get double messages.

Faculty generally respect premedical students' intellectual abilities, but very often they are not impressed with them as people. They consider them ruthlessly competitive, rude, selfish, demanding, inconsiderate, unforgiving, egotistical, hostile, etc. Faculty who speak positively about some of them individually, often genuinely dislike them as a group. Many faculty refuse to teach classes with a high proportion of premeds and have to "deal with all the hassle and nonsense." It is frustrating to try to teach students who have the attitude "just tell me what I need to know and I'll learn it; don't bother me with anything else." Factual information alone is desired. They are not interested in the subject for the subject's sake, and one extra point on an examination is worth arguing about for hours. They are not interested in how to ask questions and seek answers, the importance of underlying assumptions, and the implicit limitations. Many faculty see these attitudes as inconsistent with the need for continued independent learning in a dynamic discipline such as medicine.

Despite the concerns addressed here, premedical students as a whole are a challenging and exciting group with which to work. Periodic evaluation of the premedical/medical education continuum is certainly a worthwhile exercise, but there can be no doubt that medicine is attracting many of the most promising students enrolled in our colleges and universities, often to the dismay of other disciplines.

WABASH COLLEGE

For Additional
Information, Contact: Lester L. Hearson, Ph.D.
Department of Biology
Wabash College
Crawfordsville, IA 47933
(317) 362-1400, ext. 356

This response basically has been formulated through the function of the Wabash College Prehealth Professions Committee. The process included one-on-one and full committee discussions. Informal comments from Wabash College graduates (medical students and physicians) on the following two major issues are included.

1. Both for traditional and practical reasons Wabash College affirms the necessity, in an absolute sense, for breadth in undergraduate education of future physicians. To facilitate this being the norm for medical students it is our recommendation that beyond the specific science requirements a minimum number of humanities and social sciences courses be required for admission to medical school.

While it would not be necessary or perhaps desirable to specify particular courses to meet this requirement, the requirement should delineate particular academic areas from which courses should be taken. These areas should be designated so as to foster the development of basic skills in writing and oral expression, reading (interpretation and critical analysis), analytical reasoning, and problem solving. Social awareness also would be a goal of this requirement.

Although medical schools value, even to the point of indicating that non-science majors are viable candidates for admission, breadth in academic training, the perception is, however, that in the final analysis the admission review process lacks a consistent and firm adherence to this aspect for the selection of candidates.

Although Wabash College respondents are convinced that breadth in education is a necessary prerequisite for admission to medical school, it is their belief that testing for breadth, especially in an objective sense, would be quite difficult. Thus, while not guaranteeing breadth in education, the requirement for a specific number of courses from a range of academic subjects would definitely contribute something to the goal for academic breadth. In addition perhaps the most important aspect of the course requirement beyond the procurement of an amount of general knowledge, would be the development of an awareness and sensitivity for new and different forms of academic perspectives, methodologies, and techniques.

An additional mechanism for assessing the breadth of an individual's academic training would be to evaluate more critically the academic rigor of the undergraduate institution attended, and to rely more concretely upon the recommendation (specifically dealing with the issue of breadth) provided by a recommending body of the undergraduate institution.

An additional factor that would serve in evaluating a candidate's breadth would be to differentiate them for diversity. Diversity is here defined as a talent or skill beyond those gained through academic pursuits. A range of attributes, from athletic to musical, would qualify for this special category of evaluation. Again, such diverse qualities should be looked for and remembered in the selection of medical students.

If medical schools truly believe in the importance of breadth in education as a prerequisite for medical students then the only effective mechanism, Wabash believes, to ensure this is to specifically require (in print) a range of diverse activities.

Wabash College respondents are convinced that the liberal arts tradition for education facilitates and promotes all of the values detailed above.

2. Respondents affirm the point that formal and informal learning are equally important for the motivation of competent and productive students. The Wabash College environment tends to maximize these two elements for learning.

The formal part of our academic program (the liberal arts) needs no explanation. The informal aspect of the Wabash program is facilitated through a range of programs and opportunities. These include seminars, colloquia, reading and discussion groups, independent study, musical groups, athletic (varsity and intramural), fraternity, and other social groups. The most significant of the latter are dinners and conversation in the home of faculty. There are several subgroups to each of these categories but by specific title they are not readily identifiable. The key to the informal aspect of the educational process is for students to have ready access to various activities and feel comfortable, under the constraints of a rigorous academic program, for being involved. It is essential also that a viable (supportive and involved) faculty recognize the importance of these activities as significant additives for the total development of the individual.

UNIVERSITY OF WASHINGTON

For Additional
Information, Contact: David Prins, Ph.D.
Associate Dean
College of Arts and Sciences
B110 Padelford Hall
Seattle, WA 98195
(206) 543-5340

Prior to the Association of American Medical Colleges project, the University of Washington School of Medicine completed three major self-study activities that spanned the period from 1979 to 1982. Consequently, the institution's response to the current project was tailored specifically to complement its earlier activities and the concerns that resulted therefrom. Highlighted among these were concerns about: (1) rigid admission requirements which may impede students' acquisition of desired knowledge and attitudes; (2) education which fosters the acquisition of facts rather than principles and problem solving skills; and (3) a curriculum that does not encourage the transition to professionalism. Two committees were appointed, one in biology and the other in humanities/social sciences, to apply these concerns to the essential knowledge, fundamental skills, and personal qualities, values, and attitudes associated with college preparation for medicine.

The committees worked independently and their reports highlight the following qualities of the ideal physician and concerns pertaining to premedical education:

Concerning qualities of the ideal physician, the first group comprised essential personality characteristics: integrity, compassion, intelligence, and competence. These are not taught in college, although the right kind of atmosphere should foster and develop them.

The second group consisted of qualities or abilities that are properly the province of premedical education, although it is to be hoped that medical school will enhance some of them. They are: (1) the ability to think critically and to communicate effectively in speech and writing; (2) appreciation of the diversity of ways of investigating and understanding human beings and the world; (3) understanding the complexities of human personality and culture, a sensitivity to the differing expectations and needs of patients, and the possession of an adequate repertoire of personal responses to those needs; and (4) thirst for knowledge that leads to a lifelong commitment to the pursuit of learning.

The third group of qualities were primarily the province of medical school, although premedical education provides much of the background for them. This group includes competence in the science and technology of medicine and an awareness of the realities of modern medical practice, including ethical and social perplexities and the frustrations and stresses of practice. This awareness should include knowledge of effective coping skills appropriate to the individual physician.

In regard to premedical education, there is too much emphasis on fact acquisition and too little emphasis on understanding principles. The modes of instruction may be as important as content, and the modes should provide explicit opportunities for students to develop analytic and synthetic abilities and excellence of oral and written expression.

There is too much compartmentalization of subject matter, which prevents opportunities for integration.

Medical school admission requirements overemphasize grade point averages and test scores in narrowly-focused areas of knowledge. Such requirements and procedures have homogenized the medical student pool and created a lack of diversity therein.

The separate committee statements will be sent in their entirety to the Deans of the College of Arts and Sciences and the School of Medicine who will be asked to refer them to appropriate faculty committees for study concerning the feasibility of implementing recommended changes.

XAVIER UNIVERSITY

For Additional
Information, Contact: Sr. Grace Mary Flickinger, S.B.S., Ph.D.
Chairman
Department of Biology
Xavier University
7325 Palmetto Street
New Orleans, LA 70125
(504) 483-7526

At Xavier the AAMC study was conducted by a committee representing a cross-section of disciplines. Input was requested from each academic department and from each faculty member, each of whom received a short questionnaire. Department chairpersons were asked to discuss the topic of this report at staff meetings and to share the input with the committee, whose members reviewed it and composed their report on four institutional concerns:

1. Admissions Procedures That Select Against Minorities. The major institutional concern regarding premedical and medical education is that many current admission procedures select against minorities. As a university with a predominantly black enrollment maintaining a sizeable premed program, Xavier is most concerned with this problem. According to the AAMC Minority Admissions Report, the percentage of Black Americans gaining acceptance has been decreasing in recent years.

To address this serious problem, Xavier faculty believe that several changes are called for. First, it is felt that too much emphasis is placed on the MCAT examination in selecting students for entrance into medical school. They suggest that medical schools should stress, to a greater extent than is now being done, the college GPA and personal interviews. They also recommend that medical schools tighten their guidelines for these interviews to improve quality control and ensure a fair, standardized set of questions is given to all applicants, regardless of race. In addition to improving the quality control of these interviews, Xavier faculty urge medical schools to screen their interviews to make certain they are not racially biased, as they have observed is sometimes the case.

A further concern regarding admissions policies is the felt need for medical schools to take into consideration the fact that many students, particularly minority students, must work in order to support their undergraduate education, and hence may take more than four years to finish. Working students should not be penalized or considered not serious about their medical education, in the event that they take over four years to graduate. In fact, such is often proof of just the opposite.

A final recognized need concerning admissions policies is a bit more general in nature. We believe it is time to evaluate present admissions criteria and revise them so that they more adequately reflect the potential for success in medical school and beyond. If indeed, as studies show, the MCAT is not predictive of eventual success as a physician, then further study is warranted: first, to determine more accurate predictors for professional success in the practice of medicine; and, second, to translate these predictors into admissions criteria and mechanisms for determining them which do not militate against minority students.

2. Failure to Educate Students in Humanistic Values. Xavier faculty believe that on a national scale, premedical programs fail to educate students in humanistic values. To reverse this trend, medical schools should either require a certain number of courses in humanities and the social sciences for admission, or devise a procedure for awarding value in the admissions process for having taken such courses. Medical school should also consider giving such value for certain nonacademic experiences, such as Vista, Peace Corps, time taken out for employment, research, volunteer work, or hobbies. Such "life experiences" are admittedly nonquantifiable, but are significant in attaining "well-rounded" and "humanistic" doctors; these factors should be considered in the interviews and seriously weighed.

3. Tendency to Stress Memorization Rather Than Analytical Reasoning Skills. A third institutional concern is the tendency, on a national level, for premedical programs to stress learning through memorization rather than development of analytical reasoning skills. They believe that this is due in large measure to the current overemphasis on MCAT scores, since this exam for the most part rewards rote memorization, and so premed programs have tended to conform to this standard. They recognize a need to include and emphasize inductive reasoning across university curricula. If this is not done, medical students will continue to find it difficult to acquire the ability to make the sort of reasoned, inductive judgments required in diagnosis.

4. Lack of Emphasis on Reading and Writing. Our fourth institutional concern at Xavier is what is perceived as a lack of emphasis on development of reading and writing skills in premedical programs. Once again, it is felt that an overemphasis on the MCAT has led to this devaluing of written communication in favor of that which is strictly quantifiable. Students need not only to acquire reading and writing skills, but also to develop an esthetic appreciation for fine writing, which in turn can lead to a lifelong habit of good reading.

Many of the changes Xavier faculty would like to see integrated into premedical education nationwide have already been implemented in their curriculum with some success. One of the greatest strengths is Xavier's program to develop humanistic values in the liberal arts core, which includes courses in philosophy, theology, arts, literature, foreign language, and social sciences. In addition, Xavier has adopted three prematriculation summer programs which stress the development of analytical reasoning: SOAR (Sciences), EXCEL (Humanities), and THINK (Math/Computer Science). These Piagetian-based workshops encourage students to approach problems inductively, effectively arriving at appropriate solutions and insights.

Another important element of our program is the fact that Xavier has a strong Premed Adviser's Office. Students are kept informed of dates for the MCAT exams and deadlines for filing admissions applications. Faculty recommendations and evaluations are centralized. Furthermore, in Xavier's premedical program, all students whose stated professional objective is medicine are required to receive a degree in a subject field, such as Biology or Chemistry. It is believed that students are best served when, in addition to general preparation for medical school, they also receive more in-depth training in a particular scientific discipline.

XAVIER PAGE THREE

A final aspect of Xavier's educational strategies pertaining to its premedical program is the current introduction of a universitywide, competence-based testing program. The University Committee on Student Competence has put much study and effort into identifying student competencies, for which tests are presently being developed. Such a program will enable the university to ensure quality at significant points in each student's academic career; in this way, all graduates of the university, including premedical students, will have derived the full benefit of a broadly based, liberal undergraduate education.

SUMMARIES OF REPORTS FROM COUNCIL OF ACADEMIC SOCIETIES PROFESSORIAL ORGANIZATIONS

ASSOCIATION OF ANATOMY CHAIRMEN

For Additional
Information, Contact: Robert D. Yates, Ph.D.
Professor and Chairman
Department of Anatomy
Tulane Medical School
1430 Tulane Avenue
New Orleans, LA 70112
(505) 588-5255

Highlights from this report follow:

Anatomists are conservators of a body of fundamental knowledge of gross anatomy, microscopic and subcellular anatomy, neuroanatomy, and developmental anatomy without which the practice of medicine and surgery would be impossible. Anatomists provide a structural scaffold, a descriptive system into which newly described metabolic events and cell, tissue, organ, and body processes, as well as newer diagnostic and treatment methods, can be integrated in order to understand the normal and abnormal functions of the human organism.

Because anatomy departments are usually understaffed for the amount of teaching they must do, it is not only preferred but essential that senior faculty always participate fully in the laboratory teaching. This creates and encourages relationships between students and faculty that cannot otherwise develop, which lead to interactions at multiple levels inside and outside the classroom and laboratory, which offer role models to students, and which encourage continued contacts between students and faculty throughout the 4 years and, often, into the post-graduate years. It is important to note that 20-30% of students in most medical schools choose to take an anatomy elective in the 4th year (where such elective programs exist) and that these range the full gamut from special dissections to teaching in any of the several courses for which anatomy departments are normally responsible.

The Association of Anatomy Chairmen challenge the most basic assumption in the booklet "Charges to Working Groups" that there are two years of biomedical science education and two years of clinical science education. They assert that the preclinical sciences have been reduced in most schools to the first year plus a variable but always minor segment of the second year. In some schools the clinical departments have even begun to teach in the first year. The compression that has resulted from the de facto "three-year curriculum under which virtually all of us now operate" has led to crowding and perceived overload. They submit, however, that the "overload" in the basic sciences is miniscule compared to that faced by students in the clinical years when each specialty is motivated to impress students with its relative importance, its breadth, and its value as a residency choice.

The AAC assert that there is no more effective small group teaching than 4-6 students, 1 cadaver, and 1 instructor. What more humanistic approach can be given to a medical student than an appreciation of the unique gift that someone has made to his or her education? What better introduction to the patient, or the problems of both normal aging and of degenerative and other diseases than studying the organs of an aged cadaver? While specific courses in ethics and other humanities related to medicine may be of value, even though they further crowd an already overcrowded curriculum, we believe that the teaching of proper respect for the human body and the pivotal role that that human being is playing in his or her education is one of the best preparations a student can have for developing respect for patients and their human needs.

"On the role of clinical integration and relevance we must point out that one cannot teach Anatomy and especially Neuroanatomy or Neurosciences without constant patient-based problem-solving exercises. Weekly clinics with one or more patients have been a standard mode of teaching Neuroanatomy for over 50 years."

The AAC emphasizes that Cell Biology and Neuroscience, now largely separate disciplines, grew from anatomy departments only within the last 20 years. Virtually all departments of Cell Biology in this country are outgrowths of anatomy departments. Virtually all new department heads in anatomy have come from the ranks of cell biologists or neurobiologists, many of whom received their doctoral and/or postdoctoral training in anatomy. Much of the most exciting work in developmental biology, reproductive endocrinology, genetics, and more recently, molecular biology, has come and still comes from anatomy departments, despite the fact that anatomy departments, on average, are responsible for nearly 50% of all the teaching in the first year of medical school. Recognition of the size, nature, and value of the role of anatomists in the professional education of the physician, and other health care providers, and the creation of an appropriate system to reward quality in that endeavor, is a major problem still to be addressed.

An irony of the incredible technological advances of modern medicine is the sudden revival of interest in, more correctly the sudden need for, improved knowledge of Gross Anatomy. The CT scan and the developing NMR scan, ultrasonic imaging, infrared sensing, 2-deoxyglucose metabolic scanning, and improved anesthetic technique, has made precise knowledge of Anatomy, particularly the once esoteric subset of cross sectional anatomy, essential for the understanding and interpretation of the most modern diagnostic aids and for delivery of some of the newer modalities of treatment.

ASSOCIATION FOR THE BEHAVIORAL SCIENCES AND MEDICAL EDUCATION

For Additional
Information Contact: Shirley Nickols Fahey, Ph.D.
Director, Division of Social Perspectives in Medicine
College of Medicine
University of Arizona
Tucson, AZ 85724
(602) 626-6506

The objectives and contributions of the behavioral sciences to the general education of the physician are described as follows:

1. Extending the scientific orientation of medicine to include the field of human behavior at the individual, group, and collective levels of analysis and prediction. This extension requires continuing contributions from the disciplines of anthropology, psychology, and sociology primarily but also economics, political science, and other disciplines.

2. Helping students and physicians to improve and expand their preventive, diagnostic, therapeutic, and rehabilitative skills. Physicians are expected to deal with a wide range of health problems including, for example, alcoholism, heart disease, lung cancer, childhood behavioral disturbances, the common cold, accidental trauma, drug addiction, and mental retardation. They must be able to diagnose and treat these and many other health problems in persons from diverse ethnic and socioeconomic backgrounds. Their effectiveness and efficiency are significantly influenced by the depth of their understanding of human behavior and of the factors that produce immediate and lasting changes in behavioral patterns.

3. Helping to improve the learning process for student physicians during all stages of their professional career. Research concerned with learning, education, and professional socialization are areas of long-standing interest and competence for behavioral scientists. The use of multiple and varied teaching techniques is common in behavioral science courses, including self-instructional materials, small group teaching, role playing, patient presentations, and panel discussions. Extension of these techniques and learning principles to other basic and clinical science teaching situations is also important.

4. Strengthening the teaching skills of students and physicians so they may more effectively educate themselves, their patients, and colleagues.

5. Identifying more precisely the behavioral patterns that interact with biological processes in human health and illness so as to increase the effectiveness, efficiency, and quality of the services provided by physicians and other health professionals.

Two important points which are inherent in the above and need to be made explicit:

1. Behavioral science is taught as a science basic to all of the clinical specialties. Further, because the content areas of behavioral science relate to the full range of medical problems it perhaps has the highest yield in clinical application of any of the basic science disciplines.

2. In contrast to many of the other basic sciences, which are teaching both medical students and their own graduate students (often in the same classes), behavioral science teaches material that is integrated from several disciplines and specifically tailored for presentation to medical students in such a way that the clinical applications are apparent.

ASSOCIATION OF MEDICAL SCHOOL DEPARTMENTS OF BIOCHEMISTRY

For Additional
Information, Contact: Kurt E. Ebner, Ph.D.
Professor and Chairman
Department of Biochemistry
University of Kansas Medical Center
39th and Rainbow
Kansas City, KS 66103
(913) 588-7007

The Association of Medical School Departments of Biochemistry (AMSDB) approached the GPEP project by forming an ad hoc committee of biochemistry department chairmen, members of the education committee of the AMSDB, and representatives of public and private institutions. The pamphlet, "Charges to the Working Groups," was distributed to all member schools, which number about 150, and input was requested from all member chairmen. The committee met prior to the AMSDB annual meeting in January 1983 and formulated some general responses and concerns, as well as specific statements concerning selected items in the "Charges" booklet.

According to the AMSDB, biochemistry will continue to be central to the core of basic knowledge in medical education and will be of even more importance in the future. New knowledge is accumulating rapidly in the areas of molecular genetics, molecular endocrinology, neurochemistry, and structural immunochemistry. Medical school departments of biochemistry are struggling with an information overload. Medical biochemistry has been forced to stress the basic language and facts at the expense of problem-solving. This has resulted in too much memorization, copious handouts, and the note-taking service. The laboratory has all but disappeared.

Biochemistry should emphasize those basic principles essential for the successful continuing education of the physician throughout his/her career. There needs to be a reexamination of undergraduate prerequisites for entrance to medical school, both in the humanities and in the sciences in order to prepare students better for medical school. It is unrealistic to try to teach all of medical science to students in medical school. The information load is too great. Well-defined undergraduate prerequisites in the sciences and humanities, such as computer science, semester survey of biochemistry, statistics, microbiology, physiology, speech, logic, sociology, and humanities are realistic and would allow time for more problem-solving experiences and allow medical education to be a more graduate experience.

AMSDB's responses to specific assumptions in the "Charges" booklet include the following:

1. Information technology will not reduce the quantity of essential knowledge students learn, but it should reduce the amount of memorizing and allow more time for reasoning.

2. Grade point averages and MCAT scores are good criteria for identifying the essential knowledge to be acquired by students.

3. A solid background in the sciences and mathematics will best prepare students for study in the biomedical sciences.

4. No modifications should be made in the MCAT sections on chemistry, biology, and physics; students' scores on these sections are predictors of performances in the basic sciences.

5. Faculties can establish criteria to define breadth of college education by prescribing undergraduate courses in the humanities, social sciences, and natural sciences; they can evaluate students' breadth of college education by including English and general knowledge as areas to be tested by the MCAT.

6. A course in pathophysiology during the third year of medical school is one way of reinforcing students' assimilation of biomedical science knowledge throughout medical school.

7. Working rounds, vertical course format, and an academic track program for selected students are ways of approaching graduate medical education to make possible the greater involvement of basic science faculties in the education of residents.

8. Nutrition, geriatrics, and dietetics are areas that receive insufficient emphasis in medical school.

9. National licensing examinations should include more problem-solving type questions in order to evaluate students' knowledge of essential concepts as opposed to their store of scientific information.

10. English, speech, quantitative chemistry, logic, mathematics, and physics are college courses that help students to develop skills in reading, quantitative analytic reasoning, and problem-solving.

11. Faculties can prepare students to use advanced computer technologies later in their careers by learning to use these technologies themselves and by requiring courses in these fields.

12. Faculties do not currently stimulate students' curiosity and promote intellectual drive and imagination very well; limited time seems to be a major reason for this problem in addition to arrogance toward and belittling of students.

13. Faculties might encourage students to be skeptical, curious, and open to new ideas by ending the tendency to reward students for the ability to memorize rather than think.

14. Faculties can promote the positive aspects of competition and hard work by being role models who display enthusiasm for teaching and their work.

ASSOCIATION OF PROFESSORS OF DERMATOLOGY

For Additional
Information, Contact: Thomas B. Fitzpatrick, M.D.
Professor and Chairman
Department of Dermatology
Harvard University
Boston, MA 02114
(617) 726-3990

The Association of Professors of Dermatology, through discussions with its members, has known for some time that the time allocated for dermatology in medical school curricula is inadequate. Some medical schools have no required educational time in dermatology. This is reflected in primary care and family practice residency programs where residents begin with no prior exposure to experts. This is unfortunate because about 34% of patients with skin problems see non-dermatologists and, in a typical family practice setting, between 1 out of 7 to 1 out of 11 visits is for a dermatologic problem. Many physicians make no serious attempt to identify skin lesions promptly and precisely. Undiagnosed skin eruptions are sometimes treated blindly for months; this postponement of appropriate care prolongs discomfort, aids and abets disfigurement, and not uncommonly leads to irreversible generalization of the disorder.

Beginning next year, dermatology clinical rotations for medical students as part of a core curriculum will be required at Harvard. This decision was arrived at as a result of a study of all the specialties.

If sweeping recommendations are contemplated for medical school curricula, and if the aim is to produce primary care physicians in contradistinction to specialists, then time allocated for required dermatologic training should be sharply revised upwards. It is important to realize that most skin diseases are chronic, not life-threatening. Nevertheless, their visibility and chronicity make them of great concern to the patient. The essence of good medical skin care requires an awareness of the structure and function of skin, including an appreciation of microbiologic and immunologic interactions in skin. As a rule, these considerations are ignored or given short shrift in basic science teaching.

Even more important is a continuing clinical exposure to common dermatologic problems. Many skin diseases are unique, with a subtle fluctuating course. The best way for a non-dermatologist to learn dermatology is to have repeated short exposures to the clinical situation with experts available for consultation and discussion. The Association of Professors of Dermatology recommend that medical students starting in the second year be assigned short periodic rotations in dermatology throughout the last three years. These rotations should continue into the postgraduate years of primary care training. After five or six years of this type of learning experience it can be anticipated the average physician should have grasped the rudiments of dermatologic diagnosis and therapy. Repeated continuing medical education courses over the rest of their medical career should allow them to remain current and effective primary care physicians in caring for common dermatologic problems.

ASSOCIATION OF DEPARTMENTS OF FAMILY MEDICINE

For Additional
Information, Contact: William L. Stewart, M.D.
Professor and Chairman
Department of Community Health and Family Medicine
University of Florida College of Medicine
Box J-222, JHMHC
Gainesville, FL 32610
(904) 392-4321

The submission was developed by broad input from the Association of Departments of Family Medicine. This occurred in several ways. A copy of the booklet provided by the AAMC was sent to every member of the Board of Directors of the Association of Departments of Family Medicine along with a covering explanatory letter. At the semiannual meeting of the ADFM in Chicago in May, 1982, the project was explained in detail to all of the chairmen and their written comments and suggestions were solicited. Their responses were incorporated in this report. It should also be noted that virtually all of the chairmen are also members of the Society of Teachers of Family Medicine. Thus, their input was indirectly obtained. Finally, at a meeting of the Board of Directors of the ADFM on February 28, 1983, the project and our response was discussed at length and a consensus was reached for presentation to the AAMC Project Panel.

The discipline of Family Medicine makes several major contributions to the general professional education of the physician. These are as follows:

1. An approach to the undifferentiated patient regardless of age, sex, or medical or surgical diagnosis.

2. A consideration of the many external facets that influence the origins and manifestations of disease, i.e., family constellation and its significance, occupation, psychosocial factors, education, unusual medical beliefs, previous experience with the medical profession, etc.

3. The provision of professional care for the entire family.

4. A preventive and health promotion approach to medical care.

5. A longitudinal approach to health care with prolonged follow-up.

6. A great appreciation of the contributions of the social sciences and humanities to the care of patients.

Students' learning the discipline's essential knowledge and fundamental skills could be improved by having a required longitudinal experience in Family Medicine for every medical student in every medical school. This should be during the clinical years and presupposes a faculty of sufficient size to carry off the educational program with style. Learning can be facilitated by a number of methods, i.e., didactic lectures, required readings, seminars, small group discussions, assignment to the Family Practice Center, or carefully selected family physicians' offices, etc.

The medical school educational program can only provide the student with a broad understandng of the issues faced in family medicine. Residency training must provide a fine-tuning and honing of already learned basic skills as well as the acquisition of new, in-depth skills.

The Association of Departments of Family Medicine would hope that there would be widespread curricular changes in many medical schools as a result of the project. These curricular changes would be designed to do the following:

1. Produce a physician with an understanding of the many external factors influencing illness in an individual patient and the ability to address these factors in a therapeutic manner.

2. Produce a physician who is caring and understanding of his patients of all ages.

3. Produce a physician interested and skilled in providing preventive health care and promoting health.

ASSOCIATION OF PROFESSORS OF GYNECOLOGY AND OBSTETRICS

For Additional
Information, Contact: John Sciarra, M.D.
Chairman
Obstetrics and Gynecology
Northwestern University
Prentice Women's Hospital
333 East Superior Street
Chicago, IL 60611
(312) 649-7504

This information was formulated by the APGO Undergraduate Medical Education Committee, whose role is to oversee the education of the medical student in the reproductive sciences and in the clinical discipline of obstetrics and gynecology.

In the area of essential knowledge, the APGO Undergraduate Medical Education Committee offers the following comments:

1. It suggests that each of the basic sciences and clinical disciplines prepare a series of learning objectives for students. This should be done by the combined faculties of the basic science departments and the clinical departments, to increase the relevance of teaching and to provide for curriculum coordination.

2. It feels that it is important to teach the scientific concept, rather than simply to present scientific information. In this regard, use of current technology -- including computer technology -- should be taught and the student should learn to relate this technology to the solution of clinical problems.

3. It feels that there should be some consideration for student education in fiscal aspects of health care, specifically, an understanding of health care costs and an appreciation for health care cost containment.

4. It finds the MCAT, as presently structured, of limited utility and recommends that in the admissions process more stress be placed on verbal skills, social and behavioral sciences, and the humanities.

5. In relation to clinical clerkships, it suggests that internal medicine is the discipline providing the student with the greatest opportunity to learn medical problem-solving and to acquire basic clinical knowledge. It recommends that the required clinical clerkships should be Internal Medicine, Obstetrics and Gynecology, Pediatrics, Psychiatry, and Surgery and that Family Medicine, as a required clerkship be eliminated as most often it offers duplicate information that can be accomplished either solely from Internal Medicine or in an integrated fashion in the five other specialties.

6. It recommends that evaluation of both knowledge and performance in the clinical sciences must be improved. In addition to objective testing, oral and essay examinations should be considered to test the student's skills in patient management.

In relation to fundamental skills, the following three points are offered.

This summary was drawn from testimony presented by Dr. John Sciarra at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

1. Despite the fact that current technology has been stressed as essential knowledge, the act of taking a comprehensive and accurate history remains the most essential clinical skill. The student must be taught how to obtain integrated information about the patient's medical, personal, and social background. This is of particular importance in dealing with obstetrical or gynecologic problems.

2. Clerkships in ambulatory care are necessary. This setting provides for the development of a cost-effective differential diagnosis, while providing improved patient communication. The ambulatory experience should not replace the five major clinical clerkships, but should supplement the clinical clerkship experience.

3. The medical student should be taught the value of patient education. There are many areas where disease prevention by patient education has been shown to have exceptional impact on both health and life. One need only look in our specialty at the Pap smear and the effect that the introduction of this test has had on decreasing deaths of young women from cervical malignancy.

Finally, regarding the personal qualities, values, and attitudes of the physician, the following comments are offered.

1. The faculty involved in teaching both fundamental and clinical skills must serve as role models for medical students. This is particularly important in those clinical disciplines where teaching is by example. How the faculty member responds to the medical, social, sexual, and financial problems of the patient can be a very important learning experience for the student.

2. It is important that teachers appreciate the many stressful situations that medical students must face during their clinical years. The faculty must be taught to recognize the early signs of emotional stress in students and must learn to anticipate those situations that engender unnecessary stress or tension. This is best accomplished by dealing with students in small groups or on an individual basis.

ASSOCIATION OF PROFESSORS OF MEDICINE

For Additional
Information, Contact: Laurence E. Earley, M.D.
Professor of Medicine
University of Pennsylvania School of Medicine
3400 Spruce Street
Philadelphia, PA 19104
(215) 662-2402

The Association of Professors of Medicine Council's position paper summarizes the contribution of Internal Medicine as "What We Are Doing Now," and acknowledges its shortcomings by discussing general modifications that could improve medical school education.

Five objectives are listed in the paper: 1) the student will be able to gather pertinent data; 2) the student will be able to interpret basic clinical data; 3) the student will acquire a basic fund of medical knowledge; 4) the student will be able to function in the clinical setting; and 5) the student will develop the interpersonal skills and human qualities desirable for the physician.

In the current U.S. medical curricula, most students are first introduced to these objectives and courses directed to their achievement late in the first year or in the second year. Objective three, the acquisition of the fund of medical knowledge begins with matriculation to medical school. It is, theoretically, based on the foundation of knowledge obtained in college. Students typically perceive their initial experiences as continuation of college lecture/laboratory courses and commonly begin to question the "relevance" of material by the middle of the first year. This questioning and restlessness continues at least into the second year and more often into the first clerkships of the third year when the student feels he is "where it's at!". Meeting this objective continues throughout medical school in lectures, laboratories, assigned text reading, patient work-ups, presentations, and individual use of current medical literature to solve problems.

Students are first instructed in collection of clinical data late in the first year or in the second year. Introduction of students to patient examinations usually occurs late in the second year or at the beginning of the third year when the students begin to apply their fund of medical knowledge to the interpretation of clinical data. With the introduction of patients, students are introduced to objective five. Instruction begins in how to interact with the patient who is not at his best because of his disease.

The fund of medical knowledge grows rapidly during the second year as students pursue courses in pathology and pharmacology; they also encounter the first courses in clinical correlation--the pathophysiology courses. These courses are taught in a variety of ways ranging from multidisciplinary organ system modules to individual courses by clinical discipline, but the goal in each is to teach mechanisms of disease by demonstrating how disease alters normal physiology and anatomy. In most instances these courses provide little information about therapy.

By the end of the second year or early in the third year, formal instruction has been introduced to help the students achieve all five general objectives. The basic clinical clerkships of the third year are the primary mechanism for ensuring these objectives are achieved by each student. Intensive involvement with patient care on the basis of increasing responsibility helps the student to develop a system of self-instruction which will advance his achievement of these goals. By the fourth year, students have typically selected their fields of specialization and must plan a predominantly elective schedule to supplement their education and to achieve any additional competence necessary prior to entering specialty education.

A main issue throughout the training period is certification of achievement. Exact methods and criteria may vary widely but include specific exams (National Boards, FLEX, local exams) and subjective assessment of ward performance. These assessments form the basis for final grades that lead to awarding of the degree certifying "minimum competence."

Inadequacies in the system fall in three broad categories: (1) inadequate skills in acquiring clinical data; (2) inadequate skills in interpreting clinical data; and (3) inadequate techniques for evaluating competency. Students and teachers alike indict the medical education system on at least two of the five basic objectives! The students cannot collect data adequately and they cannot appropriately evaluate what they do collect! Students and teachers alike repeatedly point out that they are so inundated with facts, particularly in the first two years, that they never understand the "big picture" and they never develop the processing skills necessary to THINK about solutions to complex problems.

How, then, might these problems be approached? GPEP proposes the possibility of change. Where might these changes occur? The answer lies in determining what will be taught, when it will be taught, how it will be taught, and how the outcome will be tested. L. W. Eichna proposed a medical school curriculum for the 1980s which, at least in broad terms, addresses these items. Eichna begins by listing 16 principles well known but not observed. The first three principles concern the order in which the three human elements of the curriculum must be considered. Medical school education is directed toward patient-care, therefore the patient must be first. The student and teacher must vie for second and third place. This order is regularly perverted by every possible permutation.

One basic principle can thus be stated: The patient and concern for his well-being are the center of all medical education. From this principle proceeds the first major modification necessary to improve medical education: teaching and learning must be oriented to the patient. The faculty must see the patient at the bedside with the student. Faculty must listen to and talk with the patient and examine the patient with the five senses not once but regularly. In summary, teaching must return to the bedside in the clinical training.

Eichna is quick to point out that the student cannot help the patient without a proper background in biological science, but all facts and information necessary for modern medical practice cannot be taught in medical school. This identifies the second major change that needs to occur in medical education. The emphasis in medical school needs to be on mastering concepts of biology and disease. The major task is to present enough facts to permit clear understanding of basic concepts.

Eichna cites two important corollaries to the conceptual approach to teaching. First, content and time for learning need to be balanced; otherwise memorization and forgetting replace learning. Second, knowledge is best gained when sequenced with previous concepts and information that provide the requisite background. Curriculum sequencing is often poor and often reflects the needs of faculty schedules or other teaching programs rather than the needs of the student.

A continuing area of concern is that of assessment. How can relevant tests and evaluation techniques be applied to ensure that curricula and teaching methods are producing the desired result? Tests generally reflect facts known but do little to test process of thinking.

The structure of the fourth year of medical school must be improved if it is to be a meaningful learning experience for students. The faculty adviser should supervise more closely the student's choice of electives. Preceptorships should be more clearly defined and preceptors themselves should be chosen carefully.

ASSOCIATION OF MEDICAL SCHOOL MICROBIOLOGY CHAIRMEN

For Additional
Information, Contact: John H. Wallace, Ph.D.
Chairman
Department of Microbiology and Immunology
University of Louisville
School of Medicine
Louisville, KY 40232
(502) 588-5351

Members of the Association of Medical School Microbiology Chairmen Education Committee, as well as its general membership, discussed issues posed in the AAMC "Charges" booklet. Their observations are summarized as follows:

1. Microbiology faculties should attempt to structure their teaching activities on the basis of a process that would involve (a) development of course objectives that are dependent on the local definition of microbiology/immunology-related tasks which physicians must perform; (b) focus and revison of course objectives subsequent to their review with faculties from clinical departments including infectious diseases, medicine, family practice, pediatrics, and surgery; and (c) exchange of locally developed objectives with other microbiology/immunology departments, which have been through a similar process, for their comment and for final revision prior to implementation.

2. Reinforcement of the basic sciences throughout medical school training would be aided by (a) recruitment of clinical faculty members with competence in the basic sciences; and (b) the integration of basic scientists in clinical clerkship training, e.g., active participation of basic scientists in clinical rounds; establishment of combined microbiology/infectious diseases/clinical pathology conferences; and presentations of short lecture courses on current activities in the basic sciences during the clinical years.

3. Conceptualization is an individual trait, but can be encouraged by (a) provision of more experience at problem-solving in small groups; and (b) use of appropriate software with computers.

The Patient-Oriented Problem-Solving System In Immunology developed by Dr. Parker Small, and now published by the Upjohn Company upon the recommendation of the AMSMC, represents an excellent example of problem-solving activities that the AMSMC intends to encourage and aid.

4. Areas perceived to need more attention include microbiology/immunology aspects of geriatrics, the comprehensive pathogenesis-immunology-treatment spectrum of individual diseases, and complex drug interactions.

5. In general the NBME examination primarily measures retained information. The NBME exam exerts a moderate to strong influence on educational programs and/or on students' perceptions of faculty goals. The development of questions for the NBME that have a more problem-solving orientation would enhance its use

for evaluating desired student capabilities. The AMSMC will promote this approach for the microbiology/immunoloy questions on this examination.

6. Fundamental skills that should be acquired during college preparation include the ability to enter and evaluate the scientific literature, think analytically on the basis of laboratory training, and use microcomputers.

7. In general, the use of class note-taking services, syllabi, and objective examinations do not significantly facilitate the development of independent learning skills. Independent learning would be promoted by increased use of directed reading to solve a problem, library research projects, and laboratory unknowns.

8. Students could benefit by greater interaction with clinical laboratories in order to improve knowledge of which are the appropriate samples to obtain from patients, how to evaluate laboratory results, and how to fill out the necessary forms. Students should be provided opportunity to observe the laboratory, and to go through a typical patient work-up.

9. Basic science faculties generally do not do an especially effective job of stimulating students' curiosity and intellectual drive. The normal lecture format and the usual examination procedures ordinarily do not make a positive contribution in this area.

The importance of faculty members as role models for students cannot be overemphasized. This is significant, not only in the area of academic and technical skills, but also in the area of interpersonal relationships. In this regard, attention should be given to correcting the degrading practice, frequently used by clinical faculty, of using first names of mature and elderly patients who already are anxious and demoralized. Students and staff quickly adopt this practice which is especially acute in the indigent hospitals that are so widely used for training of medical students.

The AMSMC intends to promote appropriate action among its membership to:

1. Enhance the relevance and focus of the objectives with which the teaching of microbiology/immunology to medical students is approached.

2. Encourage and foster the development of problem-solving modalities for use in the teaching of microbiology to medical students.

3. Increase the pool of problem-solving, conceptual-type NBME questions.

AMERICAN ASSOCIATION OF NEUROLOGICAL SURGEONS

For Additional
Information, Contact: Martin H. Weiss, M.D.
Professor and Chairman
Department of Neurological Surgery
University of Southern California
School of Medicine
1200 North State Street, Suite 5046
Los Angeles, CA 90033
(213) 226-7421

The subtleties involved with the early recognition of disorders of the nervous system pose a major challenge to all clinicians striving to recognize such disorders prior to the evolution of a significant, possibly irreversible, deficit. In an effort to evaluate the adequacy of medical school curricula in preparing the student to meet such future challenges, the Subcommittee on Undergraduate Education of the American Association of Neurological Surgeons/ Congress of Neurological Surgeons completed a survey of medical schools in the United States to assess instruction in Clinical Neuroscience. The survey revealed extensive variability in the teaching of those Clinical Neuroscience topics related specifically to Neurosurgery with similar variability found in the particpation of neurosurgical faculty in the development of course material and subsequent presentations to students. Based upon sample Neuroscience curricular programs derived for 18 participating medical schools throughout the United States, the Subcommittee formulated a model clinical neurosurgery curriculum that represents a minimum core of information felt to be essential to the education of all medical students, particularly those whose postdoctoral education will not be focused upon the study of disorders of the nervous system. It is assumed that examinations designed to evaluate the progress of medical students (both institutional as well as National Board Examinations) will incorporate these basic elements in the body of their examination.

The following topics provide a cognitive base of information from which the practicing clinician may recognize the potential existence of a neurological disorder so that he or she may participate in the early institution of definitive care.

Basic Neuroscience. The neuroscience faculty should provide the students with information during the first two years of their medical school career that will ensure an understanding of neuroanatomy including the topography of the brain, spinal cord, peripheral nerves, as well as the cerebral vasculature. Neurophysiology, including classical electrophysiology, physiology of cerebral metabolism, and neurochemistry are equally important fundamental requisites. An instructional program in neuropathology should include the natural history of common tumors of the nervous system, congenital malformations, cerebrovascular disease, and the effects of trauma to the head, spine, and peripheral nerves, neuroendocrine disorders, and infections of the central nervous system.

Clinical Neuroscience. The clinical neuroscience faculty should determine that students are proficient in the performance of the neurological examination including techniques of history taking and the physical examination. The use and limitations of commonly employed diagnostic procedures such as lumbar puncture, cerebral angiography, myelography, EEG, and computed tomography should be presented to the student.

Prior to graduation from medical school each medical student should attain the following:

1. Knowledge of the natural history of common tumors of the nervous system, which includes an appropriate approach to the evaluation of such tumors and their natural history.

2. Familiarity with common congenital malformations of the central nervous system and the basis for counseling of parents of children afflicted with these disorders.

3. Insight into the clinical syndromes manifest in disorders of the cervical and lumbar spine including disorders of the spinal cord, nerve roots, and spinal column.

4. Understanding of the varied symptoms of hemorrhagic and ischemic cerebral vascular disease and the modes of effective therapy available for the treatment of these disorders.

5. Understanding of the pathophysiology, treatment, and prognosis of trauma to the head, spine, and peripheral nerves.

6. Knowledge of the pathophysiology and treatment modalities available for the management of pain syndromes involving both the head and cranial nerves. Common disorders such as headache, trigeminal neuralgia, and ruptured disc should be stressed along with an appreciation of the psychological needs of terminally ill patients and patients with functional states.

7. Ability to define and understand modes of treatment available for neuroendocrine disorders. pituitary tumors, pituitary and hypothalamic dysfunction of other causes, and the intricate interaction between hypothalamic-hypophyseal systems.

8. Understanding of the natural history, diagnostic studies, and treatment of infections of the central nervous system both focal and diffuse.

9. Familiarity with the multiple causes of coma, and the special examinations to be employed in an effort to focus upon the underlying pathophysiologic process.

SOCIETY FOR NEUROSCIENCE

For Additional
Information, Contact: Joe Dan Coulter, Ph.D.
Associate Professor
Marine Biomedical Institute
University of Texas Medical Branch
200 University Boulevard
Galveston, TX 77550
(409) 761-2793

The Education Committee of the Society for Neuroscience organized this effort beginning with consultation and approval of the society officers. Following initial discussions, presentations were made to the Association of Neuroscience Departments and Programs. This draft is the result of joint discussions and will be the basis for continued dialogue with the American Association of Neurological Surgeons, the Society of Neurological Surgeons, and the Association of University Professors of Neurology.

Major Concerns. The following areas are the subjects of greatest concern regarding neuroscience in medical education: (1) recognition and establishment of neuroscience as a defined, essential subject area in the medical curriculum; (2) creation and maintenance of effective interaction and communication between students, scientists, educators, and practicing physicians concerned with neuroscience education; (3) organization, structure, and conduct of neuroscience educational programs in the medical curriculum; and (4) continuing education in basic neuroscience as the foundation for advanced clinical training in the medical specialties and for the practicing general physician.

Neuroscience comprises an important part of the essential knowledge and skills required of all physicians. The brain and nervous system constitute the preeminent organ system of the body controlling, directly or indirectly, virtually every vital function, from the secretion of hormones to the language and thought characteristics of human behavior. Core knowledge in neuroanatomy, neurophysiology, neurochemistry, and other areas of neuroscience encompasses the fundamental principles of brain organization and function needed to understand, diagnose, and treat neurological and mental disorders. Basic neuroscience thus is essential, not only for the general education of all physicians, but as the basis for further specialized training in the clinical medical fields. Neuroscience, presented as a defined, multidisciplinary approach to understanding the brain and behavior, should continue to expand as an essential component of the undergraduate medical curriculum.

Modern concepts and approaches to understanding the nervous system require a fundamental knowledge of math, physics, chemistry, and general biology. Thus, adequate college preparation in these subjects in a minimum requirement. A broad, liberal college education is also desirable. However, breadth of knowledge at the expense of substantive, in-depth understanding, is not a characteristic to be encouraged as preparation for medicine. Rather, the demonstrated ability of the prospective student to define an area of interest, and to acquire substantial knowledge and skill in that area, as part of college training, is preferable.

Essential knowledge in neuroscience is comprised of those principles and concepts that provide for a rational understanding of nervous system organization and function and that serve in medical practice as the basis for diagnosis, treatment, and prevention of neurological and mental disorders.

In the undergraduate medical curriculum, basic information organized around essential concepts and principles of nervous system organization and function should consist of a single coordinated program or course of study in neuroscience presented in a multidisciplinary matter. Information on the nervous system should not be represented in the curriculum as parts of separate courses in anatomy, physiology, or other traditional subjects. Such separate courses are likely to waste time with unnecessary duplication, leave uncovered gaps, and result in unbalanced or narrow perspectives.

The neuroscience course of medical students should be planned for the latter half of the first year or in the beginning of the second year of training and comprise no less than 100 contact hours of total instruction.

In addition to conventional lecture format, presentations of patients should be included in the basic course. These clinical correlations should be carefully designed to illustrate fundamental concepts of neural function and to show how basic scientific principles can be applied to evaluate nervous system function in both health and injury or disease.

Laboratories, conferences, and other formats that allow teaching and discussion in small groups are highly desirable as a means for developing close dialogue between faculty and students.

Examinations should emphasize and reinforce the core of essential knowledge presented in the course, yet challenge the student who has sought to learn more than the basic requirements. Especially useful are practical examinations that utilize skills in analyzing and relating concrete materials and cases to concepts of neural organization and function.

The teaching functions in the course should be performed by individuals most effective in communicating and illustrating the essential concepts and principles of neuroscience regardless of their disciplinary/departmental affiliations or research interests. Evaluations of teaching effectiveness should be performed by both students and faculty on a systematic basis and appropriate changes made where indicated.

Administration and management of the course should be done through a course committee composed of the leading instructors plus faculty involved in later clinical training in neuroscience related subjects.

ASSOCIATION OF UNIVERSITY PROFESSORS OF OPHTHALMOLOGY

For Additional
Information, Contact: Robert D. Reinecke, M.D.
Professor and Chairman
Department of Ophthalmology
Jefferson Medical College
Wills Eye Hospital
Ninth and Walnut Streets
Philadelphia, PA 19107
(215) 928-3149

The combined committee that developed this response was comprised of ophthalmologists from the American Academy of Ophthalmology and the Association of University Professors of Ophthalmology. The report does not have organizational approval of any of the specifics except as noted within the body of the report.

1. The great potential for use of the computer in medical education and in practice was emphasized.

2. A firm foundation in college science and a thorough understanding of the scientific method are essential for an education in medicine. Whenever possible, students should take standard courses, not courses developed for the premedical student.

3. The MCAT provides a useful national standard and does not need changing.

4. College courses that teach writing and inductive skills would be useful.

5. Basic science must not only precede clinical study; students could take relevant basic science in their fourth year.

6. Efforts should be taken to encourage more testing of concepts.

7. To understand the scientific approach to medicine, the student should be exposed to research in medical school. Curricula void of research and thesis writing should be reassessed.

8. To define basic knowledge essential for a medical student in the disciplines, national committees of specialties could be asked to compile their goals in undergraduate teaching so that individual faculties can have a published guide as to what is important as basic knowledge and skills for the medical student. In ophthalmology a study guide was published in 1982 as a recommended outline for the student to use during required clinical rotations in ophthalmology.

The ophthalmology study guide is a product that could serve as a model approach to the problem. Data were gathered from a large number of practitioners, emergency room physicians, and general internists, as well as ophthalmologic specialists concerning what knowledge and skills were really needed for the general practice of medicine. This was then distilled down into the study guide and was validated by two further studies. This, then, forms the basis for our common curriculum design in ophthalmology.

The following position statement was adopted by the Association of University

Professors of Ophthalmology on February 1, 1983 and is thought to reflect the general attitude of ophthalmologists in the United States on the minimal requirements for medical student education in ophthalmology.

"All undergraduate students of medicine should be educated in the structure and function of the eye and visual system as well as in diagnosis and treatment of ophthalmic problems. The minimum objectives to be achieved are those included in the ophthalmology study guide for students and practitioners of medicine. These objectives encompass the basic patient problem areas of visual acuity; ophthalmoscopy; glaucoma; the red eye; injuries; amblyopia and strabismus; and neuro-ophthalmology.

"Curriculum time adequate to achieve these objectives should be assigned directly to the department or division of ophthalmology together with the authority to evaluate student performance. Teaching should include lectures, demonstrations, and supervised experience in a clinical clerkship offering student exposure to patients with ocular disorders. A required clinical rotation in the third or fourth year of one to two weeks is desirable."

9. Recently the Association of University Professors of Ophthalmology passed a resolution indicating that ophthalmology should be a required clerkship of ten days to two weeks. At the present time many medical schools have ophthalmology as an elective. It should also be pointed out that, as far as the medical student is concerned, ophthalmology is not a surgical specialty, but a medical one. Only brief exposure to surgical techniques, just so they will know what they are, is needed in the clinical clerkship.

10. Several specialties, particularly ophthalmology and dermatology, are almost exclusively outpatient oriented. Teaching facilities should be geared towards these students.

11. Disciplinary clinical clerkships that could be reduced could be those more specifically technically oriented and less fundamental, such as general surgery, obstetrics and gynecology, neurosurgery, colon and rectal surgery, cardiovascular surgery, and urology.

12. Ophthalmology should be a required elective.

13. Students should have a sufficiently lengthy exposure to individual faculty members in both formal and informal situations to allow the perception of the individual faculty members as role models. Most faculties do not stimulate the student's curiosity. Most students grind away so arduously that any imaginative curiosity they might have had disappears. Further research opportunities for the student seem imperative to regain the inquisitive appropriate mode for the clinician.

14. Faculty behavior toward the patient is probably the most important determinant of students' attitudes. The members of the faculty should exhibit the highest ethical and moral standards. Any departure from that example should be dealt with harshly and abruptly by the medical school authorities.

ASSOCIATION OF PATHOLOGY CHAIRMEN

For Additional
Information, Contact: Nathaniel F. Rodman, Jr., M.D.
Professor and Chairman
Department of Pathology
West Virginia University Medical Center
Room 2189, Basic Sciences Building
Morgantown, WV 26506
(304) 293-3213

The report presented for the Pathology Chairmen was based on reactions from 25 chairmen to the assumptions posed in the "Charges" booklet.

1. More and more physicians will use computers and will find their value increased if they know how to program them.

2. With regard to knowledge entering medical students should have, the establishment of essential knowledge required to understand normal and disease processes can be done by preparing objectives and then submitting these objectives to critical peer review. The peers who do the reviewing must be willing to make difficult decisions as to whether a given fact or concept is truly essential, merely desirable, or truly unnecessary at the undergraduate medical student level. These require delicate value judgments. Academic pathology has attempted to do this kind of review through the Group for Research in Pathology Education.

3. Regarding the chronologic orientation of basic sciences and clinical sciences, the pathologists believe that some basics are needed first, in particular pathology. But, there is much to be said for an integrated approach with correlated teaching.

4. The student must learn how to approach the library to search out whatever is needed and learn to read critically the text or journal article that is sought. One of the best ways of applying science and scientific principles to the practice of medicine is to challenge students in problem-solving situations, such as the best laboratory sessions, in small group discussions in which one has problem-solving situations in a clinical setting, with appropriate laboratory data and illustrative material, including photomicrographs and electron micrographs, and perhaps microscopic slides. Appropriate questions can be put at any of several points and many different ideas can be developed.

5. Achievement of a consensus on essential clinical knowledge could again be approached with the preparation of objectives with peer critique as described previously. Faculty must make those difficult decisions as to whether knowledge is essential, desirable, or unnecessary.

6. Essential knowledge in areas not usually taught in medical schools and perhaps essential for the general professional education of the physician would include ethics, economics, communication skills, federal and state regulations, cost containment, and the health care team concept, including all medical services and ancillary services.

This summary was drawn from testimony presented by Dr. Nathaniel F. Rodman at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

7. Many respondents do not rely on Parts 1 and 2 of the National Board of Medical Examiners examinations as a standard measurement of a student's achievement, as was stated in one assumption. Several respondents are concerned that virtually so much testing is done by objective examinations that test facts rather than concepts and also that often point to trivia rather than important facts. All pathology chairmen surveyed stated very strongly that they arranged their curricula not with an idea for students passing any examination, but rather so that the student has a solid basis on which he can progress to clinical medicine.

8. Some educational strategies that faculties might employ to facilitate independent learning skills are to reduce the numbers of lectures; stimulate the students to read both the text and other sources with these assignments being related to discussion in small groups of faculty and students; encourage students' curiosity by being receptive to questioning.

9. In assessing the medical literature, strategies which might induce the student to develop independent skills in analysis and criticism include the following: problem-solving; structured laboratory; case studies at all levels; journal clubs; involvement of students in research programs; and lastly, small discussion groups with interaction between faculty and students as part of the regular curriculum.

10. The pathology group thinks that faculties could achieve a better balance between formal and informal teaching by involving students in research projects and by being involved in activities such as medical history clubs, journal clubs, research forums, and conferences.

11. Promotion of the positive aspects of competitiveness and devotion to hard work can be conveyed by example by the faculty and also by a system of rewards. Emphasis on examination grades and class standing stimulates unnecessary and counterproductive competition. It is difficult to convince medical students that they should not be concerned about examination grades.

12. Some emotional stress is almost certain to occur in the course of the physician's general professional education. Faculties should be sensitive to such an experience. Counseling is important to reduce or eliminate unnecessary stress. The chairmen believe faculties should encourage good study habits and encourage moderate outside activities, such as sports and hobbies. Finally, they believe that students who have impaired coping mechanisms should receive counseling or psychiatric care.

ASSOCIATION OF MEDICAL SCHOOL PEDIATRIC DEPARTMENT CHAIRMEN

For Additional
Information, Contact: Beverly C. Morgan, M.D.
Chairman, Department of Pediatrics
University of California at Irvine
101 City Drive South
Orange, CA 92668
(714) 634-6483

Development of Report. The Association of Medical School Pediatric Department Chairmen Executive Committee reviewed the AAMC booklet, "Charges to Working Groups," prior to its October 1982 meeting. The president then attended the first GPEP regional hearing held in late January 1983 in San Francisco. He subsequently developed an outline of issues for consideration and further development by the Executive Committee and the General Membership of AMSPDC at the Annual Meeting in Carefree, Arizona on March 10-12, 1983.

Basic Preclinical Sciences. The basic science curricula must be preserved. Excessive intrusion upon the integrity of the basic sciences has occurred with the introduction of minicourses in introductory clinical medicine, psychosocial medicine, human sexuality, etc. These courses have eclipsed the focus of students on the basic sciences and provocative opportunities for clinical correlations, and they have eroded the time students require to assimilate the complexity and excitement of the basic sciences. As the laboratory sections of the basic sciences have been reduced in scope and time, the vacuum of curricular time has been filled by a broad spectrum of minicourses.

Within an unperturbed basic science curriculum there exists a unique opportunity to insert not only exemplary and illustrative clinical correlations but also developmental biological themes that embrace the fetus, infant, child, adolescent and the aged.

Transitional Courses. During the transitional courses of the second year, introduction to clinical medicine (history and physical diagnosis) and pathophysiology of disease, curriculum committees should include, as a dynamic, elements of early human development and aging.

The coursework in history and physical diagnosis should emphasize the development of skills in thoughtful, comprehensive, verbal communication with patients, parents, families, and colleagues. These courses should orient the student to the techniques of succinct, literate, and organized communication in the medical record.

Clinical Clerkships. In addition to the clinical arts that are an essential component of the core clinical clerkships, the biological sciences should be reemphasized during these inpatient and ambulatory experiences. Students, graduate residents, and faculty should continue to inculcate in their teaching and clinical supervisory dialogues a spirit of inquiry, concept, and pathobiology in addition to the elements of evaluation, data retrieval, differential diagnosis, and strategies of prevention and management. Students should learn how to solve clinical problems with creativity as well as practicum. They should become skilled in the use of the biomedical library as a tool for intellectualized resolution of clinical issues. Students should develop an appreciation of the range of normal laboratory data, human clinical chemistry, and the precision of laboratory methodology, and solidify their skills in performing simple laboratory procedures.

Full utilization of the senior year of medical school for balanced, advanced clinical experiences in general areas of medicine preclude the need for a transitional, rotating PG1 year prior to the initiation of three core years of pediatric postgraduate training. These advanced clerkships should be arranged in specialty disciplines other than those students wish to pursue during postgraduate training.

As pediatric departments and other clinical departments continue to add women to their faculty, and to advance them to positions of leadership, the role modelling for the growing number of young women in our medical schools will equilibrate.

The most compelling consequence of these deliberations will be the restoration of a sense of joy and enthusiasm of our medical students for the excitement, wonder, and future of biomedical sciences and human medicine, and an inclination to devote one's professional life to the intrique of investigative medicine.

ASSOCIATION FOR MEDICAL SCHOOL PHARMACOLOGY

For Addditional
Information, Contact: Desmond R.H. Gourley, Ph.D.
Chairman
Department of Pharmacology
Eastern Virginia Medical School
P.O. Box 1980
Norfolk, VA 23501
(804) 446-5630

This is a summary of discussions held at the annual meeting of the Association for Medical School Pharmacology (January 1983) relative to the AAMC Project on the General Professional Education of the Physician and College Prpearation for Medicine.

The AMSP limited its discussions to ways to improve students' acquisition of general knowledge, particularly of pharmacology, during their medical education. Discussions were held in small groups of about 8 discussants, and written reports were submitted to the coordinator for incorporation into this summary.

Pharmacology's major contribution to the general professional education of the physician is to provide the student with a foundation of the general principles of pharmacology with which to understand the mechanisms of action and the pharmacokinetics of present and future drugs, and with an organizational framework of the major drugs to facilitate the acquisition of further therapeutic knowledge during later training and medical practice.

Pharmacologists generally agree that ideally basic science study should precede clinical study in the medical curriculum. Physicians who have experienced the scientific approach to medicine emphasized by the basic science disciplines in the first two years will be better able to cope in the future with the growth of scientific knowledge and technology applicable to medical care. Basic science study introduces students to the source of biomedical knowledge--how scientific data are generated, and how sound scientific conclusions are derived from the data. Early emphasis on the scientific method provides a natural base for applying this skill to the clinical reasoning process, or problem solving. Exposure to the excitement of answering biomedical research questions, fostered by opportunities to become involved in research projects in the laboratories, may encourage medical graduates toward a career in academic medicine. Although basic medical science should precede clinical study, the scientific basis of medicine ought to be a recurring theme throughout the medical curriculum, and this can be accomplished by participation of the basic scientists in the third and fourth years.

The criteria for the basic science knowledge essential to the general professional education of the physician should be determined by biomedical scientists working closely with academic clinicians and other practicing physicians. The professional individual best able to filter the informational overload is one who is trained in the discipline developing the information. For example, the AMSP together with the Educational Affairs Committee of the American Society for Pharmacology and Experimetnal Therapeutics and representatives of the clinical pharmacology societies, would be the appropriate bodies to define the essential knowledge base of pharmacology in undergraduate medical education.

Specific methods by which the assimilation of biomedical science knowledge can be reinforced throughout undergraduate and graduate medical education will vary in each institution. Pharmacology has a high degree of relevance to clinical problem solving. Thus, the fundamentals of pharmacology can be reinforced in the clinical years by participation of pharmacologists in clinical rounds, in clerkship conferences, in conferences of specialties such as anesthesiology, cardiology, hematology, etc., by the participation of residents in pharmacological research as part of their training, by the development of programs in clinical pharmacology where lacking, and by the utilization of clinical pharmacologists or other clinicians who are sophisticated in their knowledge of clinical pharmacology and therapeutics as resources in the introductory course in pharmacology.

Pharmacologists can help students incorporate new knowledge into the care of sick people in the future by identifying and emphasizing the essential concepts that are unique to the discipline, by directing students to reliable sources of information about drugs and encouraging the use of these sources, by programs that help students to interpret promotional literature and lectures, and by educational modes which increase faculty-student interactions and independent learning. Since multiple-choice examination questions encourage the memorization of facts, evaluation procedures that emphasize concepts and problem solving should be developed and used. Further encouragement of students to conceptualize the application of science to medicine would derive from the availability of research opportunities in pharmacology for medical students, or at least by requiring that they critically read original research in pharmacology and summarize these readings before the faculty.

Pharmacologists generally regard the Part I National Board Examination as an instrument that has a dampening effect on individual disciplinary curricular flexibility and creativity. Its emphasis on the recall of facts tends to undermine curricular efforts to promote learning of pharmacological concepts. National certification in medical pharmacology ought to be provided by one or a combination of the professional pharmacology societies. Pharmacologists can take the lead in developing an examination that incorporates evaluation of the student's grasp of concepts and problem-solving ability. With the development of essential knowledge criteria by pharmacologists, new evaluation techniques could and should be criterion-referenced rather than norm-referenced.

ASSOCIATION OF ACADEMIC PHYSIATRISTS

For Additional
Information, Contact: Martin Grabois, M.D.
Chairman
Department of Physical Medicine
Baylor College of Medicine
1200 Moursund
Houston, TX 77030
(713) 797-1440

The following list of goals and objectives was jointly prepared by the Association of Academic Physiatrists and the American Academy of Physical Medicine and Rehabilitation. These are the minimum that graduating medical students should achieve. They are stated broadly and not in the form of specific instructional objectives. It is expected that medical schools will vary greatly in the strategy and personnel used to help students achieve these objectives.

Goals. The medical school graduate should, by the demonstration of the necessary knowledge, skills, and attitudes, be comfortable and competent in assessing and participating in the comprehensive continuing management of patients significantly disabled by disorders of the nervous, musculoskeletal, or closely related systems. The graduate should also recognize when the special skills of other members of the rehabilitation team are required and be prepared to work with them to achieve optimal patient comfort and functional ability.

Objectives That Relate to Knowledge. The graduate should be able to:

1. Demonstrate proficiency in the basic sciences underlying the normal and deranged structure and function of the neuromusculoskeletal and closely related systems.

2. Define and distinguish between the terms "impairment," "disability," and "handicap."

3. State the diagnostic criteria, epidemiology, pathophysiology, clinical features, natural history, and particularly the functional implications of specific neuromusculoskeletal conditions and related complications or secondary disorders.

4. Discuss the impact of chronic illness, pain, and disability on an individual, the family, and the community.

5. Describe the diagnostic approach to the presenting signs and symptoms of patients with neuromusculoskeletal disorders.

6. Select appropriate investigations for diagnosing and monitoring patients with neuromusculoskeletal disorders, interpret their results, and briefly describe their limitations and methodology.

7. Describe briefly the therapeutic options available for patients with disorders of the neuromusculoskeletal system, including the mode of action, indications, contraindications, complications, and special considerations.

8. List the members of the rehabilitative team, identifying the special abilities of each and the collective attributes of a well-coordinated team.

Objectives Related to Skills. The graduate should be able to:

1. Obtain a history from patients with disorders of the neuromusculoskeletal system, with particular emphasis on functional limitations, residual abilities, and socioeconomic status.

2. Perform a physical examination, particularly an in-depth examination of the neuromusculoskeletal system, and an evaluation of functional abilities.

3. Formulate a problem list including medical, functional, and socioeconomic problems.

4. Communicate effectively with patients, family members, and other health professionals.

5. Keep medical records with sufficient information to monitor a patient's functional progress.

Objectives Related to Attitudes. The graduate should exhibit behaviors that suggest:

1. A patient-centered rather than disease-oriented medical ethic.

2. A problem-solving inquisitiveness regarding a patient's chronic disabilities, including an eagerness to seek methods of optimizing residual abilities and preventing secondary complications.

3. Concern for the social, cultural, and economic implications of a patient's disorder and its management.

4. The patience to seek long-term solutions for chronic problems.

5. Empathy and compassion for patients with chronic illnesses and disabilities.

6. Respect for and willingness to work in harmony with other members of the rehabilitation team.

ASSOCIATION OF CHAIRMEN OF DEPARTMENTS OF PHYSIOLOGY

For Additional
Information, Contact: Norman Briggs, Ph.D.
Chairman
Department of Physiology and Biophysics
Box 551, MCV Station
Richmond, VA 23298
(804) 786-9756

Development of Responses. This association invited all physiology chairmen to react to the assumptions posed in the "Charges" booklet. Twenty-two chairmen provided responses, which were then analyzed by three officers of the ACDP, who prepared a draft response to present to the association's membership at its Spring 1983 meeting. The draft was discussed and modified to represent accurately the views of the 66 chairmen attending. The following is a summary of the result of the described processes.

Physiology's Major Contribution to the Professional Education of the Physician. Physiology plays a central role in the education of physicians because it embraces all the other basic sciences and because it forms a continuum with the clinial sciences. In explaining the function of living organisms, physiologists use biochemical and biophysical information within the context of the morphological organization of the organism. Although physiologists focus on normal function, disease is merely a quantitative change in these functions; thus, no real demarcation exists between physiology and medicine. All interventions used by physicians markedly influence a spectrum of physiological activities. Changes in both the premedical and medical school curriculum could be made to improve the environment for learning physiology. When considering these proposed changes it is important to understand that diseases produce quantitative rather than qualitative changes in function. The power and usefulness of physiology to medicine thus increases as the ability to describe function quantitatively increases. The strength of a physician will likewise increase as his ability to deal with the quantitative aspects of function increases. These principles have strongly influenced some of these recommendations for change and, if accepted, would have rather profound influences on how physiology is taught and how medicine is practiced.

1. Recommendations for the Premedical Curriculum. College level courses should develop an awareness of the various levels of learning to include the assimilation of factual information, the organization of factual information into structural systems of knowledge, learning the methods by which current knowledge has been obtained, and learning how to make a critical assessment of the validity of current knowledge. Beyond these goals the student should be able to write science concisely, clearly, and coherently, and be able to articulate and to communicate and explain scientific ideas to his peers and others. Students should have first-hand laboratory experience in applying the principles of the scientific method and should acquire a repertory of analytical and investigative techniques. To achieve these goals and a more proficient ability to manage quantitative relations, undergraduate courses in physics, chemistry, and physical chemistry must stress the conceptualization and solution of quantitative relations. The methods for achieving these solutions must be learned in strong mathematics courses that include calculus and courses

in which the use of computers can be learned. Changes in chemistry courses that should be considered are reductions in the time spent considering organic synthesis and increases in the time spent on understanding the nature of the chemical bond. Courses in physical chemistry should emphasize kinetics, thermodynamics, and electrochemistry. Courses in the humanities were not considered essential to training in physiology.

2. The Effect of the Medical College Aptitude Test. The MCAT examination as now constituted does not promote conceptual learning in premedical courses.

3. Recommendations for Changes in the Physiology Curriculum. The weak background many students have in the quantitative sciences forces faculties to minimize aspects of physiology so important to the understanding of disease.

The undergraduate medical curriculum should provide for an orderly progression in the quantitative view of physiology and biophysics. Biophysics and cell physiology should precede and lead up to organ physiology. From organ physiology there is a natural transition to organ systems physiology. Pathophysiology should be an integral part of medical physiology throughout. Normal and pathological physiology can be treated as the two sides of one coin.

Emphasis on concepts, and particularly on the application of concepts in problem solving, could be increased if the time allotted in the curriculum to physiology were increased. Other factors that minimize the opportunities for students to understand concepts are lectures that are limited to presentation of facts, objective examinations, and the lack of one-on-one contact between faculty and students.

If physiology faculties know what is wrong with physiology courses why don't they rectify the situation? The chairmen would like to find alternatives to lectures for the transfer of information. They would like to use essay and other types of nonobjective examinations. They would like one-on-one contact with students in the laboratory and in small conferences. The chairmen and faculty are reluctant, however, to make this commitment to teaching because it necessarily is at the expense of research programs. Given the realities of research funding and of promotion and tenure, the research commitment is maximized and the teaching commitment is minimized. Physiologists want to do both and most do both for they recognize the importance of research to the maintenance of their ability to evaluate physiology critically.

4. The Impact of the NBME Examination on the Learning of Physiology. The medical National Board Examination is viewed with ambivalence. On the one hand, it is felt that the absence of the NBME could lead to an erosion of the role of basic science in medical education. On the other hand, the current form of the exam is felt to have detrimental influences on medical education by putting a premium on learning facts and by downgrading conceptual learning and problem solving. Ideally this can only be rectified by changing the objective exam format to essay or possibly to an interactive computer format. In due respect to the NBME, attempts have been made to have problem-solving questions on the NBME objective exams. Unfortunately, the speed at which the student must answer the questions negates this attempt. A possible solution to this dilemma would be marked reduction in the number of questions asked combined with an increased emphasis on problem-solving questions.

PLASTIC SURGERY EDUCATIONAL FOUNDATION

For Additional
Information, Contact: Victoria M. Doretti
Executive Director
Plastic Surgery Educational Foundation
233 North Michigan Avenue, Suite 1900
Chicago, IL 60601
(312) 356-1818

Plastic surgery offers unique information and techniques to students studying medicine. The basic understanding of wound care and healing is essential not only for the student who will be handling traumatic wounds, but also for those who will be caring for various disease processes that heal following cell destruction. The basic techniques employed by plastic surgeons (careful tissue handling, thorough wound cleansing, and gentle but adequate debridement) to solve difficult problems can be used by all physicians caring for patients. It is also important that the student be aware of the recent advances in the field of plastic surgery that will be beneficial to their future patients. This applies over the range of care from the orthopaedist's patients with osteomyelitis to the psychiatrist's facially deformed patient.

There are several ways this learning can be imparted to the student. The Educational Foundation has published and is attempting to distribute to all medical students a book entitled Plastic and Reconstructive Surgery: Essentials for Students. This book will provide the basic core knowledge essential for the student. Each student at some time during medical school should have the opportunity to make and care for wounds. Creating and repairing wounds in pigs' feet in a laboratory setting with plastic surgery supervision is an excellent method to provide the practical experience and the necessary skills. Lectures to medical students, especially in the early years, will instill in them an interest in these problems. A rotation on a plastic surgery service with a plastic surgeon allows the student to participate in the care of wounds in a clinical setting and its advantages to the student.

Knowledge of techniques needed to perform surgical procedures such as tendon repair, creation of flaps, correction of congenital defects, reconstructive procedures, cancer resection and reconstruction, and aesthetic procedures should be included in specialty graduate medical education in a progressive fashion through general surgery and into plastic surgery. The details of performance of these techniques is not necessary for the medical student to know but the problems that can be corrected must be.

The concluding paragraph of this report refers to the need for careful selection of students who demonstrate personal qualities desirable in a physician.

ASSOCIATION OF TEACHERS OF PREVENTIVE MEDICINE

For Additional
Information, Contact: Max Pepper, M.D., M.P.H.
Chairman
Department of Community Medicine
St. Louis University School of Medicine
1320 South Grand Boulevard
St. Louis, MO 63104
(314) 664-9800 (Ext. 520)

Process for Development of the Report. Active participation of the Association of Teachers of Preventive Medicine in this project began in July 1982 when its Executive Committee met with AAMC staff. An ATPM ad hoc committee with members from cities in which AAMC held its regional meetings promoted ATPM participation in the hearings. Members were informed of the activities through publications and meetings. The ad hoc committee presented its report to the ATPM Board of Directors in April 1983. Major organizational concerns expressed follow:

1. Survival, growth, and development in medical schools of Departments of Preventive Medicine/Community Health to promote the knowledge, skills, and attitudes most appropriately conveyed by these Departments;

2. Support for community laboratories for educational and research work of these Departments;

3. Recruitment and admission of students to medical schools with backgrounds and motivations to continue their personal growth and development and their interest in the arts and humanities as well as in the biomedical sciences;

4. Opportunities for medical students to be involved in community services and to exercise their ethical commitments to community and personal health;

5. The development of combined MD-MPH programs and of strong residency programs in preventive medicine so as to ensure professional opportunities and sufficient role models in the field.

Preventive medicine, community medicine, and public health are defined as follows:

Preventive Medicine is a specialized field of medical practice composed of distinct disciplines which utilize skills focusing on the health of defined populations in order to promote and maintain health and well-being and prevent disease, disability, and premature death. In addition to the knowledge of basic and clinical sciences and the skills common to all physicians, the distinctive aspects of preventive medicine include knowledge and competence in biostatistics; epidemiology; administration (including planning, organization, management, financing, and evaluation of health programs); environmental health (including occupational health and medicine); application of social and behavioral factors in health and disease; and the application of primary, secondary, and tertiary prevention measures within clinical medicine.

Community Medicine has been defined as the field concerned with the study of health and disease in the population of a defined community group. Its goal is to identify the health problems and needs of defined populations, to identify measures by which those needs should be met, and to evaluate the extent to which health services effectively meet these needs. The term is also used to connote the practice of medicine concerned with groups or populations rather than with individual patients.

Public Health has been defined as one of the efforts organized by society to protect, promote, and restore the people's health. It is the combination of sciences, skills, and beliefs that are directed to the maintenance and improvement of health of all the people through collective or social actions. The programs, services, and institutions involved emphasize the prevention of disease and the health needs of the population as a whole. Public health activities change with changing technology and social values, but the goals remain the same: to reduce the amount of disease, premature death, and disease-produced discomfort and disability in the population. Public health is thus a social institution, a discipline, and a practice.

ATPM is convinced that the successful introduction and integration of the knowledge, skills, and attitudes that inform this multidisciplinary area must be led and negotiated through a Department of Preventive Medicine/Community Health in every School of Medicine and that the curricular offerings of such Departments should be available in both the preclinical and clinical years of the curriculum. Every physician must be equipped with basic knowledge, skills, and attitudes relating to the tasks of preventive medicine/community health.

The central mission of Departments of Preventive Medicine/Community Health has been eroded in recent years by lodging in these departments new areas that no not fit easily elswhere, e.g., gerontology and geriatrics, nutrition, human sexuality, emergency medicine, biomedical ethics, communications skills, death and dying.

Another concern relates to the nature of the laboratory in which preventive medicine/community health teaching and research are conducted. These departments must have a laboratory defined by a human population and its ecological relationships. This could be a neighborhood, an entire city or county, or a conglomerate of census tracts. Or it could be a lab defined by workplace (e.g., a factory, a school, a farm setting), or the subscriber population to a comprehensive health plan (e.g., an HMO). Whatever the case may be, such a population-based laboratory must have a defined denominator population about whom baseline data are accessible and available. Such laboratories are not strictly analogous to a teaching hospital! They are rapidly changing and uncontrollable environments. This special consideration raises the issue of relationships between academic Departments of Preventive Medicine/Community Health and state and local departments of public health. It has been stated that a central core of preventive medicine's approach is an appreciation of the natural history of man and the natural history of disease. Ideally an important arena for evolving this appreciation is the Department of Health of local and/or state governments. The development of such arenas for teaching, learning, and research laboratories is clearly a function of political and economic factors and in the current social climate is rather unpredictable.

AMERICAN ASSOCIATION OF CHAIRMEN OF DEPARTMENTS OF PSYCHIATRY

For Additional
Information, Contact: John E. Adams, M.D.
Chairman, Department of Psychiatry
College of Medicine
University of Florida
Box J-256 JHMHC
Gainesville, FL 32610
(904) 392-3681

The American Association of Chairmen of Departments of Psychiatry represents all of the 132 academically-based departments of psychiatry in the United States and Canada. The present study quite properly includes premedical education, since it is there that basic attitudes toward learning and the breadth or narrowness of intellectual interests are established. Premedical education is often narrowly focused, and teaching at the undergraduate level frequently emphasizes the memorization of minute detail, and skill in answering multiple-choice and short answer examinations. The Psychiatry Chairmen seriously question whether early indoctrination in this mode of learning adequately equips students for the kind of lifetime learning and evaluative capacity required by modern medicine.

Medical school admission procedures often continue the emphasis described, above. Excessive dependence on MCAT scores and science grade point averages as screening measures serve to reinforce, and in fact probably cause, the narrowness and uniformity of undergraduate preparation. Not only are students who might make major contributions in primary care areas and the less technological specialties overtly and covertly screened out, but the resultant tendencies toward uniformity within medical school classes further diminishes the opportunities for broad learning.

Does such early intellectual narrowing serve the best interests of medical students and physicians themselves? Numerous studies have suggested that an important risk factor for the development of the so-called "impaired physician syndrome" is an overpreoccupation with medical practice alone and the absence of other intellectual and avocational interests. While not wishing to prescribe a list of premedical course requirements, the Psychiatry Chairmen expressed the hope that the panel would encourage premedical advisers and medical school admissions committees to pay more than lip service to the need for a broad liberal arts education for the prospective physician.

Unfortunately, the emphasis on fine detail rather than broad principle often continues into the preclinical years of medical school. With the ongoing explosion of biomedical information, is it really reasonable to expect medical students to acquire a graduate student's knowledge of all of the basic medical sciences?

It seems that the specific details of relevant basic science material might more appropriately be taught in depth as a part of specialty education rather than expecting it to be learned, forgotten, and hopefully relearned at multiple points in the educational sequence. Basic science faculty could and should play a major role in such an approach.

This summary was drawn from testimony presented by Dr. John E. Adams at the AAMC Northeastern Regional Hearings held May 5-6, 1983.

Within the medical school curriculum, psychiatry and the behavioral sciences must continue to play a core educational role. Knowledge about normal human behavior and function, derived from several theoretical perspectives, deserves a solid position in the preclinical years, along with the basic biological sciences. Numerous studies, including a recent extensive review by a panel of the Institute of Medicine, clearly document the powerful role of behavioral issues in health and illness.

Despite a high level of technical skill, the physician who does not understand and cannot use behavioral principles is far less effective in the treatment of his or her patient. Such issues as compliance and lifestyle change are only two of many important behavioral host factors that ultimately determine the outcome of a medical intervention.

As an area of clinical expertise, psychiatry must have a prominent place in medical education. While skill in specific psychiatric treatment techniques is not a necessary part of every physician's armamentarium, knowledge of psychiatric disease is essential. Since these problems are widely distributed and heavily overrepresented in patients with other disease, the physician cannot choose to avoid psychiatric illness, no matter what his or her specialty. The signs and symptoms of the various syndromes must be known and understood since psychiatric diagnosis is not effectively made by exclusion and specific treatments are increasingly available.

Psychiatric education in medical school further develops interviewing skills. While information management technology and, in particular, computers will clearly become more important in medicine, it will not in the foreseeable future replace the skilled and sensitive interview as the physician's most efficient and effective diagnostic tool. Since psychotropic agents are the most widely prescribed, and probably most widely misprescribed drugs, knowledge of rational psychopharmacology is again essential to every physician.

Finally, the delivery of multidisciplinary health care has been extensively developed within psychiatry and this model is likely to be of increasing use to all physicians. Acquiring the above knowledge and skills requires intensive and extensive exposure to psychiatric disease and treatment settings.

The American Association of Chairmen of Departments of Psychiatry, therefore, strongly urges that psychiatry remain a required clerkship, of a minimum of six weeks duration, during the clinical years. In addition to this targeted experience, psychiatry should be more effectively integrated into the teaching of other clinical services by greater use of consultative liaison programs.

In summary, the panel was urged to recommend a broadening of premedical education and medical school admission criteria, greater selectivity in basic science education, and a continued central role for behavioral and psychiatric teaching. With the current emphasis on the technology of medicine, and the likelihood that further procedure-based approaches will be developed in the future, it is important that more humanistic and less technologic values be ensured appropriate attention in medical education.

SOCIETY OF CHAIRMEN OF ACADEMIC RADIOLOGY DEPARTMENTS

AND

ASSOCIATION OF UNIVERSITY RADIOLOGISTS

For Additional
Information, Contact: Charles Putman, M.D.
Professor and Chairman
Department of Radiology
Duke University Medical Center
Box 3808
Durham, NC 27710
(919) 684-3403

Development of Response. A joint committee of these two organizations was appointed to examine the issues identified for the GPEP working groups. Several members attended regional meetings and reported to others on the committee. One member prepared and distributed to the chief residents of all university programs a questionnaire about premedical and medical education in relation to later professional training in radiology and collated the results for presentation. This report, the result of the joint committee's discussions, was reported to the Society of Chairmen of Academic Radiology Departments (SCARD) in March 1983.

Following is a summary of the SCARD's major organizational concerns and suggestions for modifications of educational strategies:

1. Premedical Preparation. Diagnostic radiology involves the use of x-rays, ultrasound, radionuclides, electronics, electromagnetic fields, and computer science. It requires an understanding of the interaction with human tissues of the physical forces and techniques of radiology. The basic principles of these subjects are generally well enough taught in the premedical years and well enough understood by the students. It is unlikely that changes in the premedical science curriculum are likely to result in either better comprehension or better utilization of diagnostic radiology.

Changes needed in the students' premedical years include: the development of logical thinking, skill in communication, leadership and management, and a broadened liberal education that provides an understanding of the social, economic, and governmental aspects of society.

2. Radiological Education for Medical Students. Medical students should become acquainted with the increasing role of imaging in patient care. They must become familiar with the relationship of the basic medical sciences to a technology that will be an integral part of their professional lives.

It was the consensus of the committee, and of the residents who responded to the questionnaire, that strengthening the preparation in gross anatomy and systemic pathology would enhance assimilation of knowledge about interpretation of radiologic images. Comprehension of pathophysiology is indispensable to an understanding of the nature, genesis, and progress of disease, but knowledge of morphology is essential to the interpretation and utilization of imaging methods in medical diagnosis. Clear concepts of anatomy and systemic pathology will continue to exert an enhancing effect upon the acquisition of information from the new diagnostic imaging modalities and will improve the physician's ability to adopt the most efficient diagnostic strategy. In this sense, clear morphologic concepts have the same effect on learning as do scientific principles, decreasing excessive memorization of scientific information.

Diagnostic radiology bridges basic biomedical science and clinical medicine. This has implications for the instruction of all medical students and for the training of radiologists. Both should have a medical school experience that is comprehensive. It must include basic science information to build upon and a clinical exposure that facilitates the understanding of diagnostic and therapeutic objectives in all branches of medicine and surgery.

Diagnostic imaging should be learned by medical students through a personal and supervised experience. The first exposure for medical students to imaging now in most medical schools is in a fourth year elective. It may be more advantageously learned in a good clinical clerkship in radiology early in the third year. Small group teaching of a carefully planned curriculum should be supplemented by personal study of a selected series of teaching cases and observation of a selected number of ongoing examinations and interpretation sessions. Entry and exit testing would allow the evaluation of progress and enhance student learning.

An alternate method of teaching radiology prior to other clinical subjects would be to prolong the period devoted to the introduction to physical diagnosis and clinical laboratory diagnosis in order to allow an adequate experience in diagnostic radiology. This requires small group teaching with supervised study by each student of a significant number of prototypical diagnostic images. A large number of instructors is required for a fairly short span of time.

The third year clinical clerkship is more feasible in most institutions because a smaller number of instructors can instruct throughout the year. The use by students of a well-designed radiologic film self-teaching file will facilitate the development of skill in independent learning. The summary of the clinical features of the case presents the student with an exercise in problem solving. The student can decide which examination she/he would do next and can compare the choice with the one that was actually made. The student's powers of observation are challenged and she/he is required to combine the findings into a statement of differential diagnosis, ranking the diagnoses in order of likelihood. Diagnostic probabilities are established on the basis of a balance between the strength of the evidence in any particular case compared to the statistical frequency of occurrence of different diseases. At each point in the diagnostic evaluation, the student can compare his/her answer with the answers given on the teaching file folder. The operational steps involved in the learning process teach important medical skills in addition to imparting knowledge about diagnostic radiology.

The joint committee suggests consideration of a possible change in present curricula to satisfy the educational needs of all medical students. A greater initial focus on diagnosis of disease should be made in the first medical school years, followed later (third and fourth years) by learning and practicing therapeutic strategies. In the introduction to medicine course, during the pathophysiology course, or perhaps in a separate introduction to diagnosis, better integration of the basic sciences into clinical thinking might be achieved through practice exercises in problem solving.

THORACIC SURGERY DIRECTORS ASSOCIATION

For Additional
Information, Contact: Clarence S. Weldon, M.D.
Professor and Head of the Division of
Cardiothoracic Surgery
Queeny Tower, Suite 3108
Barnes Hospital Plaza
St. Louis, MO 63110
(314) 454-3458

Although the goals and objectives of the AAMC project were discussed in the national meetings of this association and the "Charges" booklet was sent to all program directors, too few of them responded to the issues raised to permit development of a consensus statement. For that reason, Dr. Clarence Weldon expressed his own personal views to the Panel. A summary of his comments follows:

An undergraduate college education is essential for medical students. Its purposes are to teach them how to think and to teach them how to communicate their thought.

Faculty teach students how to communicate thought by teaching them to read for comprehension; to write, both expositorily and creatively; to speak extemporaneously, rhetorically, and in discussion groups; and to communicate by an appreciation of visual and performing arts; and, now, to communicate thought by means of computer technology.

In teaching students to think, faculty repetitively inculcate the thoughts and thought processes of others, but the problem is that it is possible to teach people to think in different ways.

Now, the basis of biomedicine is science, and therefore, students must be taught to think scientifically--that is to say, within the confines of scientific method--but this is not to be confused with the learning of a compendium of scientific facts.

It is more important to know how the Watson-Crick molecule was discovered than it is to know how its components are arranged. It is more important to know how Sir William Harvey came upon the circulation than it is to know what the interior anatomy of the heart is.

However, eventually the doctor deals not with a scientific preparation but with other human beings, and the kind of thinking that motivates human society is not scientific and is taught in other ways, either in a temporarily linear fashion, as in history, political, economic thinking, or sensorially, as in teaching languages or the arts or religion.

The conflict of thinking methods underlies many of the conflicts in medicine and this does not mean that one type of thinking--that is, scientific as opposed to nonscientific--is supreme over the other. It means that both are essential. But, again, it is not the facts of history or the mechanics of language or the methods of politics that are important to the undergraduate, but learning that kind of thinking as well as scientific thinking.

This summary was drawn from testimony presented by Dr. Clarence S. Weldon at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

Medical schools should not interfere with the undergraduate curricula. They should devise methods in which they can choose for the medical school students who have learned how to think properly and who have learned how to communicate their thought properly.

The medical school curriculum has degenerated into a four-year "peep show" and the medical students are allowed to go to the hundreds of various specialties in medicine for two or three weeks and there they are provided information either as a kind of preview to the specialty or else they are given a lecture on the special research interests of the faculty members.

Perhaps four courses of specialty study should be established in medical school and the medical student would have to elect one of these as a special field of concentrated study. Suggestions for the four courses are neuromotor medicine, metabolic medicine, cellular biological medicine, and circulatory medicine.

Studying neuromotor medicine would lead naturally to neurology, psychiatry, neurosurgery, rheumatology, and physical medicine. Studying metabolic medicine would lead to gastroenterology, pediatrics, general surgery, obstetrics and gynecology, and endocrinology. Studying circulatory medicine leads to cardiology, thoracic surgery, pulmonary medicine, and hematology. Studying cellular biological medicine leads naturally to radiology, oncology, and, in certain forms, hematology.

Design of such a plan would require that basic scientists supply the basic requirements for each of these four courses. Furthermore, the clinicians would have to have a major course and a minor course. They would have to give the minor course to the other three groups and the major course that was dealing with their specialty.

This arrangement might encourage the medical school faculty to teach medical students. It would also stop the medical school curriculum from being a four-year window-shopping tour.

Dr. Weldon concludes, "As much as I'm convinced that the undergraduate curriculum is not professional training, I am convinced that the medical curriculum ought to be professional training. That is what we should be doing. We should be training doctors, not guiding them on a tour and allowing them to window-shop for a career for four years and then teaching them what they have to know in a residency training program.

SUMMARIES OF REPORTS FROM OTHER GROUPS

AMERICAN MEDICAL STUDENTS ASSOCIATION

For Additional
Information, Contact: Robert Mayer
President, Northwestern University Medical School
Chapter of the American Medical Students
Association
303 East Chicago Avenue, Box 328
Chicago, IL 60611
(312) 943-7021

The American Medical Students Association is the largest and only independent national organization of medical students with 21,000 members at 139 medical and osteopathic schools. The following conclusions and recommendations concerning the general professional education of the physician are drawn from resolutions adopted by the AMSA House of Delegates.

During medical school, students fail to develop their higher thought processes because they are forced to learn by rote memory. Long hours of study during their first two years and all night rotations during their last two years often leave students with an unhealthy lack of sleep. Medical schools are all too often undemocratic and students are placed under such stress that they feel like Sisyphus of Greek mythology--condemned to pushing a boulder up a steep mountain until eternity. The atmosphere of the medical school is often dehumanizing and leaves students less able to cope with rapid changes in technology and less able to communicate compassionately with their patients.

To deal with the problems identified in the preceding criticisms AMSA recommends the following measures for implementation by medical schools:

1. The establishment of new and innovative approaches to teaching medicine that will foster the growth of the students as integrated mental, physical, and spiritual individuals.

2. The establishment of medical education programs that are sensitive and responsive to actual health care needs.

3. The establishment of programs to train physicians for primary care responsibilities--from the first contact with patients to the coordination of patient health problems, be they biological, psychological, or social.

4. The ongoing support for medical scientist training programs and postdoctoral research fellowships to train physician-scientists who play a crucial role in both the laboratory and the classroom.

The American Medical Students Association makes the following specific recommendations concerning the medical school curriculum:

1. In response to the fact that every major extension of lifespan and every major decline in morbidity have been largely due to public health measures, a far greater emphasis should be placed on community health and preventive medicine. At least five percent or 250 hours of the curriculum should be allotted to teaching

---

This summary was drawn from testimony presented by Robert Mayer at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

preventive and community medicine. The content of courses in this area should include at the minimum epidemiology, biostatistics, clinical preventive medicine, nutrition, adolescent medicine, occupational medicine, health care economics, and quality primary care experiences in community health centers outside the hospital environment.

2. In response to the fact that by the year 2000, 32 percent of the U.S. population will be over the age of 65, medical school curricula should include, in both the preclinical and clinical phases, work in geriatric medicine.

3. In response to the fact that emergency medicine is such an integral component of modern medicine, every medical student should be properly trained in basic and advanced life support and first-aid.

4. In response to the fact that rapid changes in technology have made the moral dilemmas facing physicians, patients, and their families increasingly more difficult, every medical student should receive some training in biomedical ethics.

ASSOCIATION OF ACADEMIC HEALTH SCIENCES LIBRARY DIRECTORS

For Additional
Information, Contact: Gerald J. Oppenheimer
Director, Health Sciences Library
University of Washington SB 55
Seattle, WA 98195
(206) 543-8262

The Association of Academic Health Sciences Library Directors (AAHSLD) believes that the academic health sciences library can be an effective instrument for the development of strategies to improve the effectiveness of the general professional education of the physician. Next to the faculty, the library is the academic institution's main instrument and resource for acquiring, conserving, and making available the world's knowledge base. Medical education must face the issues of rapid rate of growth of knowledge basic to the practice of medicine and the rate at which that knowledge base changes. Educational programs must focus on the development of skills that will enable the physician to maintain a current knowledge base appropriate to his practice. The active participation of the academic health sciences library in the professional education process would provide an effective mechanism for dealing with the problems described. In order for such an approach to be successful, the effort must be an integral part of the medical education process as opposed to a secondary and auxiliary appendage. The following basic skills should be developed during the general professional education of the physician.

Locate Information Using a Number of Methodologies. This skill should include knowledge of traditional and innovative strategies for accessing information data bases. The teaching of these skills must be based on the concept that the students will practice in a variety of settings and that there will be significant differences in the types of information resources available in those settings.

Utilize the National Network of Information Resources. This skill should include knowledge of the relative roles of all types of information providers. Each type of library is an important provider of information and a key link in a chain of information providers. The professional education process must expose students to the mechanism for accessing information available at every link of the information chain. It should provide the student with the knowledge of the linking process so that he has realistic expectations of the information that may be available at the local information node versus that which must be accessed through the network.

Critically Evaluate the Quality and Relevance of Information Resources. Professionals suffer from information overload. The rapid rate of knowledge growth has been surpassed only by the rapid rate of information dissemination. It is imperative that the professional education processes associated with the library go beyond teaching the traditional bibliographic techniques. Instead, the process must be problem-oriented and be an integral part of the learning process. The emphasis should be on information acquisition and organizational skills.

This summary was drawn from testimony presented by Mr. Gerald J. Oppenheimer at the AAMC Western Regional Hearings held January 27-28, 1983.

LIBRARY DIRECTORS PAGE TWO

Utilize Information in a Variety of Formats. Information technology is changing as rapidly as the technology relevant to medicine. Consequently, the professional education process should expose the student to information in all currently available formats and to the forms that are in development. Reliance on one or two traditional information formats may be dysfunctional.

Organize Personal Information Files. While academic libraries are the institutions' knowledge centers, each professional must organize that portion of the total knowledge base that is most relevant to his interest.

The following educational strategies are recommended for the mastering of these skills:

1. Design the academic health sciences library as a unit with primary responsibility for exposing students to techniques for accessing information resources and for organizing those information resources useful to them.

2. Involve students at the earliest possible time in projects that expose them to the size and complexity of the knowledge base.

3. Involve students in projects that require identification of current and retrospective information resources in a variety of formats on topics relevant to other portions of the educational program.

4. Involve students on projects that require the critical evaluation of information resources.

5. Establish technological support systems for students to use in the development and maintenance of information files that will enable them to establish their own personal information management system.

6. Involve students in projects that will result in the acquisition of basic skills necessary for maintaining their own management information system.

CHICAGO MEDICAL SOCIETY STUDENT BRANCH

For Additional
Information, Contact: George B. Beranek (M4)
University of Illinois College of Medicine
1853 West Polk Street
Chicago, IL 60612
(312) 736-4317

The Chicago Medical Society Student Branch began its "Recommendations for Medical School Curriculum" with a definition of qualities deemed essential to physicians in order to serve the public: (1) the ability to diagnose and treat disease according to the current standard of care; (2) the interest to seek out and continue to acquire new knowledge long after graduation and throughout a lifetime due to the ever-expanding amount of medical knowledge; and (3) the realization that medicine cannot be practiced in a vacuum and that disease does not occur as an isolated event, but in conjunction with those social and economic forces which act on populations at any given time. Most of the comments are directed to the third requirement.

It should be noted that well-roundedness is inversely proportional to the number of requirements placed in an undergraduate curriculum. This current educational product contrasts greatly with the traditional thought that higher education's purpose is to turn out whole individuals ready to face the challenges of later life. As a group, they believe that some modifications may have to be made in order to accommodate these requirements in a liberal arts curriculum. However, for those students who are contemplating a career in medicine, these core requirements should be supplemented with a semester of each of the following: biochemistry, psychology, sociology, and general physiology. In addition, before applying to medical school, students should be advised to be able to demonstrate some course work in the following areas: foreign language, calculus, ethics/logic, genetics, computer science, statistics, humanities, and art. Although few students will be able to take courses in all of these subjects, a student should be able to choose those courses and subjects of particular interest to him or her from a variety of fields.

It should be noted that in order for this broader based curriculum emphasis to work, changes will have to be made in the MCAT in order not only to assess student proficiency in these new expanded areas, but also in order to allow some greater flexibility for those students who do not decide on a career in medicine until later in their undergraduate careers.

Disadvantages to the student arising from the organization of departments into a series of "various camps" of basic and clinical sciences were cited. This system of organization leads to a tremendous lack of coordination from a curricular standpoint. As a result, many topics are repeated ad nauseum

---

This summary was drawn from a report presented to the Chicago Medical Society Executive Branch and approved in principle by the individuals on that Committee. The report was also approved by the Chicago Medical Society Student Governing Board and the Illinois State Medical Society/Medical Student Society Governing Council.

throughout the four years while some topics are presented out of logical sequence in order to accommodate departmental schedules, while still others are given only a cursory look, if at all, such as medical ethics.

During the first two years, which, in most schools, are devoted to the basic sciences, the student is exposed to the disciplines of gross and microscopic anatomy, biochemistry, physiology, neuroanatomy, microbiology, genetics, immunology, statistics, and behavioral science.

Some of the students' recommendations for change follow.

Biochemistry. When considering changes in the current presentation of biochemistry, students noted that much of the current curriculum places a greater emphasis on biochemistry from a molecular and enzymatic point of view, with much time spent in presenting the various metabolic cycles for memorization. They felt that much of this could be better covered during the undergraduate years when the student would be able to receive a more detailed presentation of the material. This coverage of the basics on the undergraduate level would free up time during medical school so that greater emphasis could be placed on that level in discussing those aspects of biochemistry that have a greater relevance to future physicians; that is, biochemistry from a disease-oriented approach. Such an approach could cover topics such as: biochemical aspects of disease, clinical laboratory tests, medical decision making, medical genetics, and nutrition.

Pharmacology. Currently pharmacology is presented in most schools sometime during the second year as a one course block of material that the student is expected to commit to memory and be able to recall years later when faced with a patient with a particular disease entity. Students would suggest instead that a course in pharmacology that would emphasize basic principles and major categories of pharmacologic agents be offered during the preclinical years and that, in addition, the pharmacology course be expanded so that where applicable major classes of drugs could be presented where indicated in the preclinical courses of biochemistry, physiology, and neuroscience. In addition, they would like to see a structured program in therapeutic instruction included as part of the core clinical clerkships. This would have the effect of replacing the current "haphazard system" of presentation now in effect during the clinical years.

Preventive Medicine. The current preventive medicine curriculum should similarly be expanded through both the preclinical and clinical training years. In many institutions, the time allotted to preventive medicine is used as a forum to give short presentations of various topics that have been requested by preceding medical school classes. As a result a student may, in fact, have had exposure to topics such as medical ethics, medical economics, or health care delivery systems. However, a 50-minute exposure to such a topic hardly carries with the student throughout his or her professional career. Similarly, many schools never evaluate student competency in these topics after presentation. As a result, these courses are ignored by many students who use the time to concentrate on more "important" topics on which they know they will be tested.

What the students propose, therefore, would be dual programs in preventive medicine and sociomedical issues:

1. The preventive medicine course which would be given throughout the four years of medical school would, on a continuing basis, cover topics such as: occupational disease, immunization/vaccination, primary care preventive medicine, sports medicine, maternal and child health, international health, and behavioral preventive medicine. Many of these topics could be presented at almost any point during the four years while other topics would lend themselves to discussion during the clinical core clerkships.

2. While the preventive medicine course would acquaint these future physicians with some of those problems he or she is likely to face in practice, the purpose of the sociomedical issues course would be to expose the students to some of the practical issues they are likely to face on a regular, if not daily, basis in the course of their lives as physicians. Topics to be included in this course would be: medical/legal issues and current legislative topics, medical economics, issues of medical ethics, and economic grand rounds.

Ambulatory Care Medicine. Upon completing medical school training which, for the most part, takes place in tertiary care facilities, the majority of new practitioners are going to practice medicine in a primary care setting, regardless of specialty. It behooves the teaching institutions, therefore, to provide exposure to what, for most students, will be their future method of practice while the student is still in the structured environment of medical school. In many residency programs, first-year residents are required to spend a half day per week working in a "continuity care clinic." The students recommend that as part of their core clerkships they have a similar exposure to primary care medicine.

It should be noted that in order for any of these proposed curriculum changes to be effective, appropriate changes will have to be made in evaluation examinations, as well as licensing examinations.

ILLINOIS STATE MEDICAL SOCIETY

For Additional
Information, Contact: Lawrence Hirsch, M.D.
Illinois State Medical Society
55 East Monroe
Chicago, IL 60603
(312) 782-1654

In recent years, medical education has faced numerous challenges and crises, such as questions concerning the relationship between the basic and clinical sciences, the evaluation of manpower shortages, and the increasing costs of medical education. The Illinois State Medical Society, representing over 18,000 practitioners, has assumed a number of positions in support of quality medical education. The following items summarize some of these positions.

Developing Creative Programs in Basic Science. The phenomenal advances in technology and scientific research over the last 20 or 30 years are continuing at an ever increasing pace, both with and without funding. A medical student's background in the basic sciences should emphasize the scientific method and provide familiarity with scientific concepts and terminology. These principles set the stage for lifelong learning in the sciences and allow future clinicians the opportunity to deal with changes in medical technology. The fostering of lifelong learning ensures a strong linkage between undergraduate, graduate, and continuing medical education. Another means of systematizing these basic science backgrounds and avoiding information overload is to emphasize knowledge structure as opposed to pure data or information. These elements can be seen as a hierarchy with raw, scientific data forming the base, leading to a more organized information level and finally to a systematic and useful knowledge. This approach could make the science curriculum more personal and practical as students prepare for their clinical years.

Selecting Students To Be Good Medical Students and Physicians. There are few differences in the basic students, the basic individuals, as they go through the medical curriculum and medical school experience. They get socialized to medicine, but, as individuals, they are still the same. So, although the facility in basic science and clinical techniques is vital for a physician, other qualities prove to be indispensable for a medical graduate to succeed in his profession. Concern for others as individuals, strong moral convictions and societal values, and an awareness of humanities and liberal arts help make a physician a well-rounded individual. It is very important that students have curricular opportuniites in their premedical studies, as well as in medical school, to strengthen and broaden such humanistic qualities.

The question of becoming a good medical student and physician also concerns the role in medicine for which the graduate has been trained. A physician should have a choice of being a clinician, academician, or researcher. At times, however, medical school unwittingly stresses a research or academic orientation, without giving adequate attention to the art of being a practicing clinician. Since the vast majority of medical graduates do become clinicians, we need to see appropriate emphasis on each of the roles of a physician. The models provided by medical

---

This summary was drawn from testimony presented by Dr. Lawrence Hirsch at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

school faculty are critical in developing an awareness of what constitutes these three roles of the physician. In order to be an effective teacher, each faculty member must realize his potential as a role model. The ultimate goal of four years of medical education should be to produce an ethical individual capable of performing clinical skills under supervision during his postgraduate education.

Supporting the Philosophy That Those Licensed to Practice Should Be Comparable. The Illinois State Medical Society has always advocated high standards for medical education and the need to ensure that practicing physicians have fulfilled necessary educational requirements for the profession, regardless of where they received their medical training. In order to promote mutually acceptable high standards, medical education programs need to maintain communication with each other so that productive changes and advances in curriculum might be achieved. Such communication should benefit the analysis of clinical specialty areas where students spend their undergraduate clinical training. Consideration should be given to possible similarities and differences with a view toward restructuring traditional specialties to avoid unnecessary duplication of time, effort, and even departments. This could take the form of greater interdisciplinary training, as well as the development or redesigning of clinical exposures.

Developing Diversified Postgraduate Training and Exposing Residents to Alternative Practices. The pressure of selecting an appropriate specialty area is one that can be overwhelming unless the student has the opportunity to experience a sufficiently wide variety of clinical studies and practice environments. Decisions concerning the geographic factors and types of practice, as well as specialty area, may be made in partial ignorance. Medical school tends to create specialists before it creates doctors. One possible solution might be to coordinate the fourth year of medical school and the first postgraduate year to give a diversified training experience tailored to a student's particular need.

Providing Financial Aid for Medical Students. One of the most critical areas affecting medical education today is the inflation of costs for attending medical school and the accompanying decrease in available funds for students to use in financing their education. This situation moves aside and into other areas excellent students who otherwise would and should go to medical school. The Society has supported the continuation of guaranteed student loans and other funding sources in the face of current trends to curtail many such programs. In addition, it has recently developed a new student loan program through its educational and scientific foundation to provide Illinois medical students with small-term and short-term loans.

MINORITY AFFAIRS SECTION OF THE GROUP ON STUDENT AFFAIRS

For Additional
Information, Contact: Carolyn M. Carter, Ph.D.
Assistant Dean of Student Affairs
and Special Student Projects
University of Pittsburgh School of Medicine
3550 Terrace Street Scaife Hall
Pittsburgh, PA 15261
(412) 624-1498

In their presentation, representatives from the Minority Affairs Section of the Group on Student Affairs stressed the importance of having the minority perspective well developed. They also expressed their concern that the Project Panel's report and recommendations reflect their concerns. They offered the following recommendations in regard to Essential Knowledge:

1. That AAMC undertake a national study to look at the performance of minority group students in medical school and at factors that may help predict their success or failure.

2. That all premedical students be required to take one or more courses on United States Ethnology.

3. That medical school curricula include and present clinical conditions commonly found in all ethnic/racial groups and include discussions of cultural factors that might influence approaches to treatment as well as contain cultural electives.

4. That all premedical and medical students be required to take one or more courses in ethics.

5. That all medical school curricula contain required courses in ethics.

6. That all faculty be more mindful of the influence they exert over the future physician and pay careful attention to their representation of different ethnic/racial groups.

Nine recommendations were made having to do with Fundamental Skills:

1. That undergraduate colleges design curricula to assist students attain basic skills such as reading critically, writing and speaking effectively, analytic reasoning, and problem-solving.

2. That medical schools offer specific workshops on learning skills, including how to study and how to take tests.

3. That medical schools develop flexible curricula including the small group model of instruction.

4. That medical school curricula include instruction in the use of the computer.

This summary was drawn from testimony presented by Dr. Carolyn Carter et al. at the AAMC Midwestern Regional Hearings held March 24-25, 1983.

5. That medical schools develop goals and objectives for all their courses in the basic and clinical sciences. Evaluation of clinical performance should address specific goals and objectives providing adequate feedback to students.

6. That medical schools make research opportunities available to minority students and provide adequate funding.

7. That medical schools develop strategies, including workshops, to educate students in physician stress management and in interdisciplinary collaboration (skills and stresses).

8. That education in medicine include culturally relevant factors in history taking, medical evaluation, and treatment strategies.

9. That medical schools develop and maintain a representation of minority medical students and faculty that is commensurate with the numbers of minorities in the general U.S. population.

Nine recommendations related to Personal Qualities, Values, and Attitudes:

1. That undergraduate colleges and medical schools take into account the minority students' noncognitive skills and strengths when making admission decisions.

2. That medical schools encourage and nurture desirable qualities in their students by providing among others positive reinforcement, opportunities for participation in school committees, and opportunities for involvement in community activities.

3. That medical school faculty members be mindful of their paramount role in imparting good medical ethics and personal qualities to medical students.

4. That medical schools teach social, economic, and community aspects of medicine in a relevant and structured manner to all students.

5. That medical schools develop real, close, and important ties with community organizations and individuals.

6. That faculty be role models through an adviser system where at least one faculty member knows a student well, can diffuse stress, assist with coping, and discuss predictable/potential stress.

7. That various teaching styles be utilized in medical schools.

8. That workshops be developed to increase faculty awareness of their demands on students and their attitudes that impair students.

9. That the range of student services include designated time on/off, extended breaks in curriculum, counseling systems, seminars in stress, student-oriented activities, and support groups.

PROPOSAL FOR A PROGRAM IN HUMAN HEALTH AND GLOBAL SECURITY

For Additional
Information, Contact: Howard Kornfeld, M.D.
Policy Scholar
Institute for Health Policy Studies
UCSF School of Medicine
1326 Third Avenue
San Francisco, CA 94143
(415) 666-4921

Dr. Howard Kornfeld, Policy Scholar at the University of California at San Francisco School of Medicine's Institute for Health Policy Studies, presented elements of the Proposal for a Program in Human Health and Global Security to the AAMC Project panel at the Western Regional Hearings, January 27-28, 1983. Excerpts from Dr. Kornfeld's presentation follow:

"Thirty-eight years ago the nuclear age began and with every passing decade the destructive potential of nuclear weapons has increased by roughly a millioneth order of magnitude. Three years ago for the first time in history physicians' voices were effectively sounded to call attention to this global threat, a threat that could annihilate our civilization and threaten the survival of our species. The apostles of winnable and survivable nuclear war had been emboldened. Their message was seeping into academic journals and political rhetoric. The American Medical Association condensed the response of dozens of medical organizations and hundreds of thousands of physicians and medical institutions when it issued its historical statement in 1981:

> In a spirit of concern the AMA Board of Trustees believes that it is incumbent upon the Association to inform the President and Congress of the United States of the medical consequences of nuclear war and that no adequate medical response is possible.

"(In) the prevention of nuclear war . . . the participation of the medical profession is essential . . . . For our unstable planet what is essential is the capability of the medical and health professions to assist our other scientific and academic colleagues to communicate the human dimensions of these technical facts and acronyms and figures that constitute the data base and the reality of global nuclear threat.

"I propose, however, an even broader agenda and one that is rooted in biological reality of unmet human needs and of resource depletion. Global insecurities are compounded by increasing competition for scarce resources. To achieve global security all human societies must be able to provide their citizens with basic necessities for a healthy, decent life. Physicians and health professionals have special expertise with which to understand the medical consequences when these needs are not met. Chronic shortages of food, clean water, medical care, energy, shelter, and clothing in the developing countries are responsible for a degree of suffering morally incompatible with the wealth and capabilities of the developed world. Every day that hunger and disease go unchecked for a large segment of humanity the likelihood increases that desperate solutions will emerge.

This summary was drawn from testimony presented by Dr. Howard Kornfeld at the AAMC Western Regional Hearings held January 27-28, 1983.

"Less than ten kilograms of plutonium are needed for a crude atomic device. The world's inventory of plutonium is in the hundreds of thousands of kilograms. Each commercial nuclear reactor can produce hundreds of kilograms of plutonium a year. In the face of this reality it is evident that our own security is not attainable in the face of global insecurity. Fifty-five nations currently possess nuclear research or power reactors, and dozens of these countries will have the capability to produce nuclear weapons by the year 1990. Yet, the international policing effort to control the proliferation of nuclear weapons has an annual budget of only $30 million, half the size of the average police budget of a medium large city in the United States.

"Medical educators and professionals share the danger of this greater drama with all of humanity. . . . (T)his panel, however, (has) a unique opportunity, the opportunity to cultivate the compassion and the intelligence of our future physicians to ease the world through this most difficult transformative period of human history."

RURAL PRACTICE NETWORK

For Additional
Information, Contact: John D. Matthew, M.D.
Box 157
Plainfield, VT 05667
(802) 454-8336

The past decades have seen an enormous and welcome growth in the technical capabilities of American medicine, but scientific and technical achievement has encroached upon other important aspects of the profession. Medical education, and the practice of many of its products, are out of balance. The public is offered unduly costly care from practitioners who are often unaccomplished in many important aspects of this healing art. Too many specialists and not enough generalists are produced with the result often being uncoordinated, discontinuous, expensive care in an atmosphere that lacks the warmth and concern the medical profession should afford each of its patients.

The medical schools graduate physicians who are able to practice after one year of internship, but lack a solid general competence for practice or a broad view of medicine's role in society. Many, if not most, of these individuals further specialize, eventually practicing as specialists with too little general knowledge and limited nontechnical skills in numerous areas. Many of the excessive supply of specialists then undertake primary care without primary care training, providing options for care that are more costly and less satisfactory than what could be offered. In training and in practice, physicians suffer numerous personal difficulties at least in part importantly influenced by premedical and medical education and subsequent patterns of practice. The public and the physicians themselves are being short-changed.

It has been shown that overall management of one's health care by a competent generalist or small scale practice at the primary care level reduces overall health costs by 20 to 40%, yet medical schools turn out graduates poorly prepared by way of knowledge, skills, and attitudes to perform this function, who go on to become exquisitely expert partialists who populate society's misnamed system of care and largely control medical education.

It has been shown that care in hospital-based practice is the most costly form of care delivery, with private practice care less costly and care in community health centers least costly, yet future physicians are trained mainly in the least efficient organizational form.

It has been shown that risk factor intervention, well care, and preventive medicine prevent illness, prolong life, and reduce health care costs, yet

---

This summary was drawn from testimony presented by Dr. John Matthew at the AAMC Northeastern Regional Hearings held May 5-6, 1983. It was made on behalf of the 12-member practices of the Rural Practice Network, a nationwide network of rural medical practices comprising 39 practicing physicians. It was given after compiling responses from the network's practices and from a few physicians in teaching centers associated with a member practice. The draft of this testimony was circulated to the member practices and to the network's board of directors, who concurred with and endorsed it.

training, practice, and research are concentrated largely on solutions for illness once it has developed, too often to the exclusion of attention to prevention.

It has been shown that numbers of health problems and innumerable health costs are due to lifestyle and dietary factors, yet this is hardly emphasized to our students who are not equipped to most effectively influence these factors if they do recognize the need. This educational process encourages an increasingly narrow view of the professional role and responsibilities of physicians, to the point that the most important determinants of health are often left unattended by the profession.

It has been shown that modest interventions to provide information and emotional support to patients receiving ordinary care in hospitals for matters as disparate as fractures, myocardial infarction, general surgery, and obstetrical delivery result in shorter hospital stays, improved outcomes, and/or lower costs of care. Yet, the educational and caring aspects of the physicians' role in training are neglected.

More capable generalists, equipped with management, preventive medicine, patient education, caring, and organizational capabilities as well as biomedical science expertise, must be provided.

Medicine is not only a biological science, it is a social intervention as much as anything else--a world of people, not merely of ideas and concepts subject to quantitative measurement and titration of numbers.

Medical education should be reoriented to achieve proper balance in the profession between the abstract/technical fields that form the necessary and important intellect of medical science and the human arts that are its neglected heart and soul.

Problems in the three areas under discussion in the AAMC project--essential knowledge, fundamental skills, and personal qualities, values, and attitudes--were discussed. Following are some of the methods or strategies by which change might be effected in such areas:

1. An AAMC section or center for excellence in medical education.

2. A gathering and dissemination of information concerning such areas as patterns of influence, instilling of motivation, attitudinal consequences, pervasive attitudes, the fate of idealism, influences on specialty interests, and changing perceptions of the professional role in the process of medical education.

3. Workshops, seminars, etc. for medical school teachers, to aid in periodic upgrading of their teaching skills and continuing redevelopment of the curriculum.

4. Rigorous ongoing evaluation of medical education by medical students, recent graduates, and practicing physicians, in order to influence retention of

faculty and curriculum design. It is not enough to applaud the best teachers. The worst must be eliminated and the curriculum continually subject to review.

5. Alterations in faculty selection processes to emphasize personal qualities as well as clinical competence in order to provide role models, including those of superb primary care providers, to medical students. These persons should have the vision and charisma to inspire their students to seek excellence and to provide considerate, humane care attentive to human detail as much as to scientific expertise. They should become the leading members of the faculties of medicine, with the vigor to bring about ongoing renewal in our curriculum and educational strategies.

6. Curriculum committees composed of clinicians, including a heavy representation of generalists, with reduction of the role of Ph.D.s and other nonclinicians in determining the direction and content of medical education at individual schools of medicine.

7. In new medical student selection, more emphasis on persons who have some interpersonal as well as scientific aptitudes, avoiding the "loners" who are not well suited to clinical work, but who may be attractive to researchers who are looking for proteges in the advancement of basic medical science.

8. Development of orientation and counseling systems for medical students which address the problems enumerated above. Such persons should be in the dean's office and/or on the curriculum committee to influence such matters as testing schedules and to ensure adequate provision for recreation and recognition of excessive stress in the students.

9. Early exposure of new medical students to role choices and various modes of practice, including well regarded primary care practices outside the academic centers, perhaps through seminars and first-year practice clerkships or visits.

10. Development of methods to rapidly influence core curriculum as information becomes available in nonclinical areas, for example, in preventive medicine or practice management, as we are now in the clinical disciplines.

11. Change of evaluation techniques to include methods of evaluating nontechnical skills. These might include such methods as structured observation, problem-solving clinical exercises, and computer-based differential diagnostic exercises.

12. Allocation of monies to fairly remunerate practitioners who host preceptees in their practice. Students should be exposed to practitioners of the highest caliber in such practices. Instruction should be of fully comparable clinical teaching value and importance as instruction in the parent institution. Presently such exposure, of great importance to medical education, is obtained at net cost to the practitioner.

SAN FRANCISCO MEDICAL SOCIETY

For Additional
Information, Contact: Susan B. Waters
Executive Director
250 Masonic Avenue
San Francisco, CA 94118
(415) 567-6230

Dr. Rolland C. Lowe, member of the Board of Directors and immediate past president of the San Francisco Medical Society, focused his comments on the project assumptions for each of the three working groups.

For the practicing physician, the 1980s will represent a period of tremendous change in the ways medicine is practiced and in physicians' relationships with their patients. The public has clearly expressed their determination to control the escalating cost of health care. This determination is already causing major changes in the way health care is delivered and will have profound consequences for physicians during the next 10 to 20 years. Practicing physicians have already found their present medical school education inadequate in handling these changes, and they are desperately trying to gain the kind of knowledge and skills they need and to reassess their values in these changing times.

Dr. Lowe noted that none of the 13 general assumptions stated in the study addressed this public concern. He suggested that two additional assumptions be considered:

1. The outside social, political, and economic factors will impact more heavily on the physician's ability to care for his or her patients, and physicians will need to learn more on how to relate to these external factors. Possible issues for workshops to consider may include such areas of knowledge as understanding the way social, political, and economic factors interact with care of patients, e.g., how changes in reimbursement and eligibility for public programs that fund public health care will affect the care available to patients, or how legislative and regulatory changes may create positive or negative impacts on patient care and the skills physicians may need to possess. How can physicians work effectively with the community for the public good? Physicians may need to be guardians of the public's health and to work collectively toward that end. In other words, this assumption would relate to trying to develop concepts of the physician in response to the external factors that are surrounding them and impinging on them.

2. The competitive model in health care financing will bring changes in practice patterns, threatening the quality of care in the name of cost containment. Thus, internally, within the health care system the physician's fiscal responsibility will intensify, and, therefore, possible issues for the working groups to consider in the field of knowledge may include: what are the ways properly to utilize health resources, what are considered reasonable diagnostic workups and treatment alternatives; in the area of skills, how to be an effective manager of physician-controlled health care dollars; and, in the area of values, commitment to be an advocate for patients on quality of care issues or the

---

This summary was drawn from testimony presented by Dr. Rolland C. Lowe at the AAMC Western Regional Hearings held January 27-28, 1983.

feeling that physicians have a sense of responsibility to be a good fiscal agent for their patients.

In closing, Dr. Lowe pondered why these assumptions were not included before. He asked: Can it be that the burning issues for the public today are not issues new physicians should be concerned about? Or are they unable to play a role in consideration of those issues anyway, so why worry them about them? Or can it be that those in academia have been too insulated and thus are not able to focus on these current issues? Or that the present lack of focus in the curriculum on these issues is the reason that recent graduates say they were unprepared for the frustration of medical practice? Or that this lack of awareness is the reason why most physicians in academia are too busy to join in the collective effort to effect changes in society and by such inaction create role models for younger physicians who seem aloof and unwilling to be involved in the community?

"In these changing times," he concluded, "the public expects greater physician responsibility in addressing these issues in health care and we join with the public in hoping the medical schools will prepare the future generations of physicians adequately to meet these challenges. The San Francisco leadership in organized medicine stands willing to help in whatever ways are appropriate."

SOCIETY FOR HEALTH AND HUMAN VALUES

For Additional
Information, Contact: Andrew L. Jameton, Ph.D.
Assistant Adjunct Professor of Medical Ethics
Institute of Health Policy Studies
School of Medicine
University of California
1326 Third Avenue
San Francisco, CA 94143
(415)

The Society for Health and Human Values is a member of the AAMC Council of Academic Societies and meets annually with the Association in Washington. Founded in 1969, its primary objective is to support informed concern for human values as an essential, explicit dimension of medical education. A new subdivision of the Society, the Association of Humanities Faculties in Medical Education, represents the interests of faculty with a full-time professional commitment to teaching and scholarly research in humanities and medical education. The Society's conclusions and recommendations concerning the role of the medical humanities in the general professional education of the physician and college preparation for medicine follow.

Medical humanities include a group of vital and growing academic fields. Their wide variation reflects a broad range of conceptions of medical practice. Each existing medical humanities teaching program is tailored to the medical philosophy and objectives of the school in which it operates. Programs are affected by such variables as the size of the school, the specialties emphasized, the presence or absence or an undergraduate school, and so on. In its 1980 survey, the Society found about 554 humanities activities and courses in 109 medical schools; one hundred fifty-six (156) of these were required and about 300 were elective. For instance, 93 ethics courses were taught in 59 schools, and 16 of these were required. Other topics included history, law, death and dying, literature, philosophy, humanities, religion, art, and languages. Activities included special lectures, symposia, journal clubs, rounds, and student and faculty retreats.

The medical humanities are not a remedial program for those who lack an adequate undergraduate education. Revising criteria for selecting medical students can improve their humanities backgrounds, but college undergraduate programs are no substitute for professionally related study of medical humanities. Undergraduate programs are not geared to the objectives of medical practice; they have their own objectives. Furthermore, college students and teachers generally lack clinical experience. If medical schools want students with stronger humanities preparation, they will need to offer more instruction in these areas to students. Medical humanists recognize how pressured the medical curriculum is. They know already that students do not receive enough of the basic sciences and clinical material. They can only give students what they need to begin to seek out what they will need later. Students cannot learn in medical school all they need to know of ethics and humanities to practice with mature judgment, but a balanced general medical school education requires significant, selective exposure to the most important aspects of medical humanities.

This summary was drawn from testimony presented by Dr. Andrew Jameton at the AAMC Western Regional Hearings held January 27-28, 1983.

To express commitment to a sophisticated approach to professional values, medical schools need to make this commitment visible to students by integrating explicit humanities material into the curriculum, to employ faculty to teach these courses, to present these issues in clinical settings, and to support research in medical humanities. Each campus should have a humanist who could lead research in these areas and to act as a role model for students in the medical humanities.

The medical humanities provide skills, knowledge, and values basic to all medical specialties. Some of the skills the medical humanities teach include the following: (1) how to balance clinical objectives with respect for persons; (2) how to analyze complex value issues and integrate them into good clinical judgment; (3) how to think critically and to communicate effectively; (4) how to integrate clinical experience into a developing understanding of the doctor/patient relationship; and (5) how to develop a personal perspective on the meaning of practice during an extended career.

The medical humanities also convey a broad knowledge base about such subjects as: (1) accepted and considered views on the ethics of medical practice; (2) interdisciplinary knowledge needed to use scientific information maturely; (3) scientific factors in resolving complex medical value problems, such as terminating aggressive therapy; (4) the values that direct practice and how these values are related to other human values; and (5) ideals, commitments, and interpretations of experience shaping patients' expectations of medical care.

APPENDIX

Rosters*
Project on the General Professional Education of the Physician and College Preparation for Medicine
Association of American Medical Colleges

Members of the Project Panel

Steven Muller, Ph.D., Chairman; President, The Johns Hopkins University and The Johns Hopkins Hospital

William P. Gerberding, Ph.D., Vice-Chairman; President, University of Washington

David Alexander, D. Phil., President, Pomona College

John S. Avery, M.D., Practicing Physician, and Assistant Clinical Professor of Medicine, University of Colorado Medical School

Jo Ivey Boufford, M.D., Vice President for Medical Operations, New York City Health and Hospitals Corporation

Paula J. Clayton, M.D, Professor and Head, Department of Psychiatry, University of Minnesota Medical School**

John W. Colloton, Director, The University of Iowa Hospitals and Clinics; and Assistant to the President for Statewide Health Services

James A. Deyrup, Ph.D., Professor of Chemistry, University of Florida

Stephen H. Friend, M.D., Ph.D., Resident in Pediatrics, Children's Hospital of Philadelphia, University of Pennsylvania School of Medicine

---

*This list shows titles of individuals as they where when they accepted their appointment to these groups

**Resigned January 11, 1983

John A. Gronvall, M.D., Professor of Pathology, and Dean, University of Michigan Medical School

Robert L. Kellogg, Ph.D., Professor of English and Dean, College of Arts and Sciences, University of Virginia

Victor R. Neufeld, M.D., F.R.C.P. (C), Professor, Departments of Medicine and Clinical Epidemiology and Biostatistics; and Chairman, The M.D. Program, Faculty of Health Sciences, McMaster University

David C. Sabiston, Jr., M.D., James Buchanan Duke Professor of Surgery and Chairman, Department of Surgery, Duke University Medical Center

Karl A. Schellenberg, M.D., Ph.D., Professor and Chairman, Department of Biochemistry, Eastern Virginia Medical School

Robert T. Schimke, M.D., Professor and Chairman, Department of Biological Sciences, Stanford University

Lloyd H. Smith, Jr., M.D., Professor and Chairman, Department of Medicine, University of California at San Francisco School of Medicine

Stuart R. Taylor, Ph.D., Professor in Physiology and Pharmacology, Mayo Medical School and Graduate School of Medicine, University of Minnesota

Daniel C. Tosteson, M.D., Caroline Shields Walker Professor of Physiology, and Dean, Faculty of Medicine, Harvard University; and President, Harvard Medical Center

Burton M. Wheeler, Ph.D., Professor in English and Religious Studies, Washington University

Members of the Working Group on Essential Knowledge

John A. Gronvall, M.D., Chairman; Professor of Pathology, and Dean, University of Michigan Medical School

DeWitt C. Baldwin, Jr., M.D., Assistant Dean for Rural and Community Health, and Director, Office of Rural Health; Professor of Psychiatry and Behavioral Sciences and Professor of Family and Community Medicine, School of Medicine, University of Nevada, Reno

Jo Ivey Boufford, M.D., Vice President for Medical Operations, New York City Health and Hospitals Corporation

Fairfield Goodale, M.D., Professor of Pathology and Dean and Medical Director, Medical College of Georgia

Robert Keimowitz, M.D., Associate Dean for Student Affairs and Admissions, and Professor of Medicine and Health Care Sciences, George Washington University School of Medicine and Health Sciences

Roberta A. Monson, M.D., Practicing Physician, and Associate Professor of Medicine, University of Arkansas College of Medicine, Little Rock, Arkansas

George Nardi, M.D., Professor of Surgery, Harvard Medical School

Alan L. Pearlman, M.D., Professor of Neurology and Physiology, Washington University School of Medicine

Robert T. Schimke, M.D., Professor and Chairman, Department of Biological Sciences, Stanford University

Harvey V. Sparks, M.D., Professor and Chairman, Department of Physiology, College of Human Medicine, Michigan State University

Arnold A. Strassenburg, Ph.D., Professor of Physics, State University of New York at Stony Brook

James V. Warren, M.D., Professor of Medicine, Ohio State University College of Medicine

John C. Weston, Ph.D., Professor of Biology, Muhlenburg College

Peter C. Whybrow, M.D., Professor of Psychiatry, Dartmouth Medical School

Nora Zorich, University of Illinois College of Medicine, Medical Scholars Program in Biochemistry, Champaign, Illinois

Members of the Working Group on Fundamental Skills

Victor R. Neufeld, M.D., F.R.C.P. (C), Chairman; Professor, Departments of Medicine and Clinical Epidemiology and Biostatistics; and Chairman, The M.D. Program, Faculty of Health Sciences, McMaster University

JW Carmichael, Jr., Ph.D., Professor of Chemistry, and Director, Project SOAR, Xavier University of Louisiana

James A. Deyrup, Ph.D., Professor of Chemistry, University of Florida

John P. Geyman, M.D., Professor and Chairman, Department of Family Medicine, University of Washington School of Medicine

Alan B. Knox, Ed.D., Professor of Continuing and Vocational Education, University of Wisconsin School of Education

Donald A. B. Lindberg, M.D., Professor of Pathology, and Director, Information Science Group, University of Missouri School of Medicine

Nina Matheson, M.L., Special Expert Consultant, Planning Office, National Library of Medicine

William L. Morgan, Jr., M.D., Associate Chairman and Director of Educational Programs, and Professor of Medicine, University of Rochester School of Medicine and Dentistry

Robert E. Olson, M.D., Ph.D., Professor of Biochemistry, and Associate Dean for Academic Affairs, University of Pittsburgh School of Medicine

Thomas L. Pearce, Ph.D., Assistant Dean, College of Arts and Sciences; Associate Professor in Biology; and Premedical and Health Professions Adviser, University of Virginia

George F. Sheldon, M.D., Professor of Surgery, University of California at San Francisco; and Chief, Trauma & Hyperalimentation Services, San Francisco General Hospital

Harold C. Sox, Jr., M.D., Director, Division of General Internal Medicine, Department of Medicine, Stanford University Medical Center

M. Louis van de Beek, M.D., Resident, Department of Obstetrics and Gynecology, State University of New York at Stony Brook School of Medicine

Members of the Working Group on Personal Qualities, Values, and Attitudes

Robert L. Kellogg, Ph.D., Chairman; Professor of English and Dean, College of Arts and Sciences, University of Virginia

John S. Avery, M.D., Practicing Physician, and Assistant Clinical Professor of Medicine, University of Colorado Medical School

George L. Baker, M.D., Professor of Pediatrics and Associate Dean for Student Affairs and Curriculum, University of Iowa College of Medicine

Amy Caucutt, M.B.A., Rochester, Minnesota

Paula J. Clayton, M.D., Professor and Head, Department of Psychiatry, University of Minnesota Medical School*

Jeptha W. Dalston, Ph.D., Executive Director, University of Michigan Hospitals, and Professor of Hospital Administration, School of Public Health, University of Michigan

Don E. Detmer, M.D., Professor of Surgery and Preventive Medicine, University of Wisconsin Medical School

Eleanor L. I. Franklin, Ph.D., Professor of Physiology and Biophysics, Howard University College of Medicine; and Professor, Howard University Graduate School of Arts and Sciences

Kathryn M. Hunter, Ph.D., Assistant Professor of Humanities in Medicine, Department of Preventive, Family, and Rehabilitation Medicine, University of Rochester School of Medicine and Dentistry

Robert Lang, M.D., Associate Professor of Medicine, Yale University School of Medicine; and Chief, Endocrine Section, V.A. Medical Center, West Haven, Connecticut

Jack D. McCue, M.D., Chief, Internal Medicine Teaching Program, University of North Carolina, Moses H. Cone Memorial Hospital, Greensboro, North Carolina

Michael G. McGrath, Ph.D., Associate Professor of Chemistry, College of the Holy Cross, Worcester, Massachusetts

Martha L. Sanford, Senior Medical Student, University of Minnesota School of Medicine, St. Paul, Minnesota

Lee Sechrest, Ph.D., Director, Center for Research on Utilization of Scientific Knowledge; and Professor of Psychology and Medical Care Organization, Institute for Social Research, University of Michigan

---

*Resigned January 11, 1983

T. Joseph Sheehan, Ph.D., Professor and Head, Department of Research in Health Education, University of Connecticut Health Center, Schools of Medicine and Dental Medicine

William Paul Thompson, M.D., Practicing Physician, and Clinical Professor of Medicine, Loma Linda University and the University of Southern California Schools of Medicine

Members of the AAMC Project Staff

John A. D. Cooper, M.D., Ph.D., President

August G. Swanson, M.D., Project Director; Director, Department of Academic Affairs

Mary H. Littlemeyer, Editor and Project Coordinator; Senior Staff Associate, Department of Academic Affairs

Barbara D. Roos, Assistant Project Coordinator, Department of Academic Affairs

F. Daniel Davis, Assistant Editor, Department of Academic Affairs

Martha R. Anderson, Ph.D., Staff Associate, Department of Academic Affairs; Special Staff to the Working Group on Essential Knowledge*

Janet Bickel, Staff Associate, Division of Student Programs, Department of Academic Affairs; Special Staff to the Working Group on Personal Qualities, Values, and Attitudes

James B. Erdmann, Ph.D., Director, Division of Educational Measurement and Research

Emanuel Suter, M.D., Director, Division of Educational Resources and Programs; Special Staff to the Working Group on Fundamental Skills

Xenia Tonesk, Ph.D., Program Director, Personal Characteristics and Skills Assessment, Division of Educational Measurement and Research, Department of Academic Affairs; Special Staff to the Working Group on Fundamental Skills

---

*Resigned August 1, 1983

PARTICIPANTS IN THE AAMC PROJECT ON THE GENERAL PROFESSIONAL EDUCATION OF THE PHYSICIAN AND COLLEGE PREPARATION FOR MEDICINE

U.S. AND CANADIAN MEDICAL SCHOOLS

1. Albany
2. Arizona
3. Arkansas
4. Baylor
5. Boston
6. Bowman Gray
7. Brown
8. Calgary
9. California, Los Angeles
10. California, San Diego
11. California, San Francisco
12. Case Western
13. Chicago (Pritzker)
14. Colorado
15. Connecticut
16. Creighton
17. Dartmouth
18. Albert Einstein
19. East Carolina
20. Florida
21. George Washington
22. Georgia
23. Hawaii
24. Howard
25. Indiana
26. Iowa
27. Jefferson
28. Johns Hopkins
29. Kansas
30. Kentucky
31. Loma Linda
32. Louisiana, New Orleans
33. Louisiana, Shreveport
34. Maryland
35. Massachusetts
36. McMaster
37. Mercer
38. Miami
39. Michigan State
40. Michigan
41. Minnesota, Duluth
42. Minnesota, Minneapolis
43. Missouri, Columbia
44. Missouri, Kansas City
45. Mount Sinai
46. Nebraska
47. Nevada
48. New Jersey Medical
49. New Mexico
50 New York Medical
51. New York
52. New York, State University of, Buffalo
53. New York, State University of, Upstate
54. North Carolina
55. North Dakota
56. Northwestern
57. Ohio, Medical College of
58. Ohio State
59. Ottawa
60. Pennsylvania
61. Pennsylvania State
62. Pennsylvania, Medical College of
63. Pittsburgh
64. Rochester
65. Rush
66. Saint Louis
67. South Carolina
68. Southern Illinois
69. Stanford
70. Stritch
71. Texas Tech
72. Texas, Galveston
73. Texas, Houston
74. Tufts
75. Tulane
76. Utah
77. Virginia
78. Washington (Seattle)
79. Wisconsin, Medical College of
80. Wisconsin
81. Wright State
82. Yale

PARTICIPANTS IN THE AAMC PROJECT ON THE GENERAL PROFESSIONAL EDUCATION OF THE PHYSICIAN AND COLLEGE PREPARATION FOR MEDICINE

UNDERGRADUATE COLLEGES AND UNIVERSITIES

1. Brandeis
2. Brigham Young
3. California, Santa Cruz
4. Carleton
5. Clemson
6. Connecticut
7. Davidson
8. Fordham
9. Hamilton
10. Haverford
11. Hunter
12. Iowa State
13. Johns Hopkins
14. Kansas
15. Michigan
16. Montana State
17. Pomona
18. Simon Fraser
19. Smith
20. Texas, Austin
21. Virginia
22. Wabash
23. Washington (Seattle)
24. Xavier

COUNCIL OF ACADEMIC SOCIETIES PROFESSORIAL ORGANIZATIONS

1. Anatomy
2. Behavioral Sciences
3. Biochemistry
4. Dermatology
5. Family Medicine
6. Gynecology and Obstetrics
7. Medicine
8. Microbiology
9. Neurological Surgery
10. Neuroscience
11. Ophthalmology
12. Pathology
13. Pediatrics
14. Pharmacology
15. Physical Medicine
16. Physiology
17. Plastic Surgery
18. Preventive Medicine
19. Psychiatry
20. Radiology
21. Thoracic Surgery

PROGRAM

WESTERN REGIONAL HEARINGS

Cole Hall
University of California School of Medicine
513 Parnassus Avenue
San Francisco, California

PRESIDING: Steven Muller, Ph.D., Chairman, AAMC Project Panel on the General Professional Education of the Physician*; and President, The Johns Hopkins University and The Johns Hopkins Hospital

Thursday, January 27, 1983

TIME	PRESENTERS
9:30 a.m.	UNIVERSITY OF WASHINGTON SCHOOL OF MEDICINE (SEATTLE) Theodore J. Phillips, M.D., Associate Dean of Academic Affairs
	UNIVERSITY OF COLORADO SCHOOL OF MEDICINE Jack Nolte, M.D., Assistant Dean for Curriculum
	UNIVERSITY OF CALGARY FACULTY OF MEDICINE John S. Baumber, M.D., Ph.D., Associate Dean of Undergraduate Medical Education
10:00 a.m. - 11:00 a.m.	DIALOGUE: Drs. Phillips, Nolte, Baumber; Panel; and Audience
11:00 a.m. - 11:20 a.m.	COFFEE BREAK
11:20	STANFORD UNIVERSITY SCHOOL OF MEDICINE Robert W. Cutler, M.D., Associate Dean of Medical Education
(Reactor)	UNIVERSITY OF CALIFORNIA, LOS ANGELES, SCHOOL OF MEDICINE Martin A. Pops, M.D., Associate Dean for Student and Curricular Affairs
(Reactor)	UNIVERSITY OF NEW MEXICO SCHOOL OF MEDICINE Leonard M. Napolitano, Ph.D., Dean
11:30 a.m. - 12:30 p.m.	DIALOGUE: Drs. Cutler, Pops, Napolitano; Panel; and Audience
12:30 p.m. - 2:00 p.m.	LUNCH BREAK
2:00 p.m.	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, SCHOOL OF MEDICINE Alan Goldfien, M.D., Associate Dean
	PROPOSAL FOR A PROGRAM IN HUMAN HEALTH AND GLOBAL SECURITY Howard Kornfeld, M.D., Policy Scholar, Institute for Health Policy Studies, University of California, San Francisco
(Reactor)	LOMA LINDA UNIVERSITY SCHOOL OF MEDICINE Rene Evard, Ph.D., Associate Dean for Admissions
2:20 p.m. - 3:20 p.m.	DIALOGUE: Drs. Goldfien, Kornfeld, Evard; Panel; and Audience
3:20 p.m. - 3:40 p.m.	COFFEE BREAK
3:40 p.m.	UNIVERSITY OF NEVADA SCHOOL OF MEDICINE Neal Ferguson, Ph.D., Dean of Continuing Education
	UNIVERSITY OF CALIFORNIA, SAN DIEGO, SCHOOL OF MEDICINE Andrea Hattersley, Director, Health Professions Program
(Reactor)	UNIVERSITY OF UTAH SCHOOL OF MEDICINE Hiroshi Kuida, M.D., Assistant Dean of Admissions
4:00 p.m. - 5:00 p.m.	DIALOGUE: Dr. Ferguson, Ms. Hattersley, Dr. Kuida; Panel; and Audience
5:00 p.m.	RECESS

---

* The AAMC Project on the General Professional Education of the Physician and College Preparation for Medicine is made possible by a generous grant from The Henry J. Kaiser Family Foundation.

Friday, January 28, 1983

TIME	PRESENTERS
9:30 a.m.	ASSOCIATION OF TEACHERS OF PREVENTIVE MEDICINE Max Pepper, M.D., M.P.H., Chairman, Department of Community Medicine, St. Louis University School of Medicine
9:40 a.m. - 9:55 a.m.	DIALOGUE: Dr. Pepper; Panel; and Audience
9:55 a.m.	ASSOCIATION OF PROFESSORS OF DERMATOLOGY William L. Epstein, M.D., Chairman, Department of Dermatology, University of California, San Francisco, School of Medicine
10:05 a.m. - 10:20 a.m.	DIALOGUE: Dr. Epstein; Panel; and Audience
10:20 a.m.	SAN FRANCISCO MEDICAL SOCIETY Rolland C. Lowe, M.D., Member, Board of Directors; and Immediate Past President
10:30 a.m. - 10:45 a.m.	DIALOGUE: Dr. Lowe; Panel; and Audience
10:45 a.m. - 11:05 a.m.	COFFEE BREAK
11:05 a.m.	EXPERIMENTAL INTERDISCIPLINARY PREMEDICAL PROGRAM DeWitt C. Baldwin, Jr., M.D., Assistant Dean for Rural Health, University of Nevada School of Medicine
11:10 a.m. - 11:15 a.m.	DIALOGUE: Dr. Baldwin; Panel; and Audience
11:15 a.m.	ASSOCIATION OF ACADEMIC HEALTH SCIENCES LIBRARY DIRECTORS Gerald J. Oppenheimer, Director, Health Sciences Library, University of Washington (Seattle) School of Medicine
11:25 a.m. - 11:40 a.m.	DIALOGUE: Mr. Oppenheimer; Panel; and Audience
11:40 a.m.	SOCIETY FOR HEALTH AND HUMAN VALUES Andrew L. Jameton, Ph.D., Assistant Adjunct Professor of Medical Ethics, Institute for Health Policy Studies, University of California, San Francisco
11:50 a.m. - 12:05 p.m.	DIALOGUE: Dr. Jameton; Panel; and Audience
12:05 p.m.	UTAH'S SUSTAINED STUDIES ON THE MEASUREMENT OF PHYSICIANS-IN-PRACTICE AND PHYSICIANS IN TRAINING Calvin W. Taylor, Ph.D., Professor of Psychology, University of Utah
12:15 p.m. - 12:30 p.m.	DIALOGUE: Dr. Taylor; Panel; and Audience
12:30 p.m.	ADJOURN

PROGRAM

SOUTHERN REGIONAL HEARINGS

Room 3.001 Main Building
University of Texas Medical School
6431 Fannin Street
Houston, Texas

PRESIDING: Steven Muller, Ph.D., Chairman, AAMC Project Panel on the General Professional Education of the Physician*; and President, The Johns Hopkins University and The Johns Hopkins Hospital

Thursday, February 24, 1983

TIME	PRESENTERS
9:30 a.m.	BOWMAN GRAY SCHOOL OF MEDICINE AT WAKE FOREST UNIVERSITY Nat E. Smith, M.D., Professor of Medicine; and Associate Dean
	UNIVERSITY OF TEXAS MEDICAL SCHOOL AT GALVESTON Julian I. Kitay, M.D., Professor of Internal Medicine and Physiology; and Associate Dean for Curricular Affairs
	MERCER UNIVERSITY SCHOOL OF MEDICINE Ralph E. Berggren, M.D., Professor of Internal Medicine and Physiology; and Associate Dean for Educational Programs
10:00 a.m. - 10:45 a.m.	DIALOGUE: Drs. Smith, Kitay, Berggren; Panel; and Audience
10:45 a.m. - 11:15 a.m.	COFFEE BREAK
11:15 a.m.	UNIVERSITY OF VIRGINIA Thomas L. Pearce, Ph.D., Associate Professor of Biology; Premedical and Health Professions Adviser; and Assistant Dean, College of Arts and Sciences
(Reactor)	XAVIER UNIVERSITY OF LOUISIANA JW Carmichael, Jr., Ph.D., Professor of Chemistry; Director, Project SOAR--A High School/College Bridge Program for Science Majors; and Health Professions Adviser
(Reactor)	UNIVERSITY OF TEXAS AT AUSTIN Jeanne M. Lagowski, Ph.D., Professor of Zoology; and Associate Dean, Education for the Health Professions
11:45 a.m. - 12:30 p.m.	DIALOGUE: Drs. Pearce, Carmichael, Lagowski; Panel; and Audience
12:30 p.m. - 2:00 p.m.	LUNCH BREAK
2:00 p.m.	UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON Waldemar A. Schmidt, M.D., Ph.D., Associate Professor of Pathology and Laboratory Medicine; and Assistant Dean for Curricular Affairs
	BAYLOR COLLEGE OF MEDICINE Temple W. Williams, Jr., M.D., Professor of Medicine and Microbiologu/Immunology; and Co-Director, Infectious Disease Lab, The Methodist Hospital
(Reactor)	UNIVERSITY OF SOUTH CAROLINA SCHOOL OF MEDICINE Richard J. Weymouth, M.D., Ph.D., Chairman, Department of Anatomy; and Associate Dean of Academic Affairs
2:30 p.m. - 3:15 p.m.	DIALOGUE: Drs. Schmidt, Williams, Weymouth; Panel; and Audience
3:15 p.m. - 3:45 p.m.	COFFEE BREAK
3:45 p.m.	ASSOCIATION OF MEDICAL SCHOOL DEPARTMENTS OF BIOCHEMISTRY Kurt E. Ebner, Ph.D., Chairman, Department of Biochemistry; University of Kansas School of Medicine
	ASSOCIATION FOR MEDICAL SCHOOL PHARMACOLOGY Desmond R.H. Gourley, Ph.D., Chairman, Department of Pharmacology, Eastern Virginia Medical School

---

* The AAMC Project on the General Professional Education of the Physician and College Preparation for Medicine is made possible by a generous grant from The Henry J. Kaiser Family Foundation.

Thursday, February 24, 1983
(Continued)

TIME	PRESENTERS
	TEXAS MEDICAL ASSOCIATION J.E. Miller, M.D., Member, Council of Medical Education
4:15 p.m. - 5:00 p.m.	DIALOGUE: Drs. Ebner, Gourley, Miller; Panel; and Audience
5:00 p.m.	RECESS

Friday, February 25, 1983

TIME	PRESENTERS
9:30 a.m.	LOUISIANA STATE UNIVERSITY SCHOOL OF MEDICINE AT SHREVEPORT Tomas C. Welbourne, Ph.D., Associate Professor of Physiology and Biophysics; and Chairman, Curriculum Committee
	UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE William D. Mattern, M.D., and Romulo E. Colindres, M.D., Associate Professors of Medicine; and Co-Chairmen, Curriculum Review Task Force
(Reactor)	UNIVERSITY OF FLORIDA COLLEGE OF MEDICINE Charles P. Gibbs, M.D., Professor of Anesthesiology and Obstetrics and Gynecology; and Assistant Dean for Curriculum
	UNIVERSITY OF MIAMI SCHOOL OF MEDICINE* Jonathan J. Braunstein, M.D., Associate Professor of Medicine; and Associate Dean of Medical Education
	LOUISIANA STATE UNIVERSITY SCHOOL OF MEDICINE AT NEW ORLEANS--SPECIAL TOPICS COURSE Janine Edwards, Ph.D., Assistant Professor of Family Medicine, and Howard J. Randall, Ph.D., Associate Dean of Student Affairs
10:00 a.m. - 11:00 a.m.	DIALOGUE: Drs. Welbourne, Mattern, Colindres, Gibbs, Edwards, Randall; Panel; and Audience
11:00 a.m.	ADJOURN

---

* The presentation by Dr. Braunstein of the University of Miami School of Medicine was cancelled due to his last minute illness.

PROGRAM

MIDWESTERN REGIONAL HEARINGS

Auditorium Room 1.027 Ward Building
Alumni Center for Continuing Education
Northwestern University Medical School
Chicago, Illinois

PRESIDING: Steven Muller, Chairman, AAMC Project on the General Professional Education of the Physician*; and President, The Johns Hopkins University and The Johns Hopkins Hospital

Thursday, March 24, 1983

TIME	PRESENTERS
9:30 a.m.	SOUTHERN ILLINOIS UNIVERSITY SCHOOL OF MEDICINE Howard S. Barrows, M.D., F.R.C.P.(C), Professor of Neurology and Medical Education; and Associate Dean for Educational Affairs
	UNIVERSITY OF MINNESOTA/DULUTH SCHOOL OF MEDICINE Omelan A. Lukasewycz, Ph.D., Associate Professor of Medical Microbiology and Immunology; and Assistant Dean for Curricular Affairs
	RUSH MEDICAL COLLEGE Gerald S. Gotterer, M.D., Ph.D., Associate Dean for Medical Student Programs
	UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE Dwayne A. Ollerich, Ph.D., Professor of Anatomy; and Associate Dean
10:10 a.m. - 10:45 a.m.	DIALOGUE: Drs. Barrows, Lukasewycz, Gotterer, Ollerich; Panel, and Audience
10:45 a.m. - 11:15 a.m.	COFFEE BREAK
11:15 a.m.	UNIVERSITY OF MISSOURI/KANSAS CITY SCHOOL OF MEDICINE Harry S. Jonas, M.D., Professor of Obstetrics and Gynecology; and Dean
	LOYOLA UNIVERSITY STRITCH SCHOOL OF MEDICINE Linda K. Gunzburger, Ph.D., Assistant Professor of Community and Family Medicine; and Associate Dean for Continuing Medical Education
	MICHIGAN STATE UNIVERSITY COLLEGE OF HUMAN MEDICINE John W. Jones, M.D., Professor of Educational Programs; and Director, Track II Program
	MINORITY AFFAIRS SECTION OF THE GROUP ON STUDENT AFFAIRS Carolyn M. Carter, Ph.D., Assistant Dean for Student Affairs and Special Programs, University of Pittsburgh School of Medicine
11:55 a.m. - 12:30 p.m.	DIALOGUE: Drs. Jonas, Gunzburger, Jones, Carter; Panel; and Audience
12:30 p.m. - 2:00 p.m.	LUNCH BREAK
2:00 p.m.	NORTHWESTERN UNIVERSITY MEDICAL SCHOOL Melton E. Golmon, Ph.D., Professor of Education; and Director of Medical Education
	UNIVERSITY OF IOWA COLLEGE OF MEDICINE George L. Baker, M.D., Professor of Pediatrics; and Associate Dean
	INDIANA UNIVERSITY SCHOOL OF MEDICINE James E. Carter, M.D., Professor of Obstetrics and Gynecology; and Associate Dean of Student and Curricular Affairs
	UNIVERSITY OF CHICAGO PRITZKER SCHOOL OF MEDICINE Harry A. Fozzard, M.D., Otho S.A. Sprague Professor, Departments of Medicine and Pharmacological and Physiological Sciences; and Chairman, Curriculum Committee
2:40 p.m. - 3:15 p.m.	DIALOGUE: Drs. Golmon, Baker, Carter, Fozzard; Panel; and Audience
3:15 p.m. - 3:45 p.m.	COFFEE BREAK

---

* The AAMC Project on the General Professional Education of the Physician is made possible by a grant from The Henry J. Kaiser Family Foundation.

Thursday, March 24, 1983
(Continued)

TIME	PRESENTERS
3:45 p.m.	ASSOCIATION OF PATHOLOGY CHAIRMEN Nathaniel F. Rodman, M.D., Chairman, Department of Pathology, West Virginia University School of Medicine
	ASSOCIATION OF PROFESSORS OF GYNECOLOGY AND OBSTETRICS John J. Sciarra, M.D., Ph.D., Chairman, Department of Obstetrics and Gynecology, Northwestern University Medical School
	THORACIC SURGERY DIRECTORS ASSOCIATION Clarence S. Weldon, M.D., Chairman, Department of Cardiothoracic Surgery, Washington University School of Medicine
	ASSOCIATION OF MEDICAL SCHOOL MICROBIOLOGY CHAIRMEN John H. Wallace, Ph.D., Chairman, Department of Microbiology and Immunology, University of Louisville School of Medicine
	PLASTIC SURGERY EDUCATIONAL FOUNDATION Martin C. Robson, M.D., Chairman, Department of Plastic and Reconstructive Surgery, University of Chicago Pritzker School of Medicine
4:35 p.m. - 5:15 p.m.	DIALOGUE: Drs. Rodman, Sciarra, Weldon, Wallace, Robson; Panel; and Audience
5:15 p.m.	RECESS

Friday, March 25, 1983

TIME	PRESENTERS
9:30 a.m.	UNIVERSITY OF MISSOURI/COLUMBIA SCHOOL OF MEDICINE Hazel J. Scott, Ph.D., Assistant Professor of Psychiatry; and Associate Dean for Student Affairs
	UNIVERSITY OF KENTUCKY COLLEGE OF MEDICINE Terrence M. Leigh, Ed.D., Assistant Dean for Academic Affairs
	UNIVERSITY OF MINNESOTA/MINNEAPOLIS MEDICAL SCHOOL Robert J. McCollister, M.D., Associate Dean for Curriculum Affairs
	AMERICAN MEDICAL STUDENT ASSOCIATION Robert Mayer, First Year Medical Student and AMSA Chapter President, Northwestern University Medical School; and Member, AMSA National Committee on Medical Education
10:10 a.m. - 10:45 a.m.	DIALOGUE: Drs. Scott, Leigh, McCollister; Mr. Mayer; Panel; and Audience
10:45 a.m. - 11:15 a.m.	COFFEE BREAK
11:15 a.m.	MEDICAL COLLEGE OF WISCONSIN Jeffrey H. Garrison, M.D., Assistant Professor of Physical Medicine and Rehabilitation
	MEDICAL COLLEGE OF OHIO/TOLEDO Howard S. Madigan, M.D., Associate Professor of Surgery; and Associate Dean for Continuing Medical Education
	INTEGRATED SEVEN YEAR PREMEDICAL-MEDICAL PROGRAM OF THE UNIVERSITY OF MICHIGAN SCHOOL OF LITERATURE, SCIENCE & ARTS AND THE MEDICAL SCHOOL Nicholas H. Steneck, Ph.D., Associate Professor of History; Acting Codirector of Inteflex; and Director, Collegiate Institute for Values and Science
	ILLINOIS STATE MEDICAL SOCIETY Lawrence L. Hirsch, M.D., Member, Board of Trustees; and Professor and Chairman, Department of Family Medicine, Chicago Medical School
11:55 a.m. - 12:30 p.m.	DIALOGUE: Drs. Garrison, Madigan, Steneck, Hirsch; Panel; and Audience
12:30 p.m.	ADJOURN

PROGRAM

NORTHEASTERN REGIONAL HEARINGS

Hosack Hall
New York Academy of Medicine
Two East 103rd Street
New York, New York

Thursday, May 5, 1983

PRESIDING: William P. Gerberding, Ph.D., Vice Chairman, AAMC Project Panel on the General Professional Education of the Physician*; and President, The University of Washington

TIME	PRESENTERS
9:30 a.m.	STATE UNIVERSITY OF NEW YORK UPSTATE MEDICAL CENTER AT SYRACUSE COLLEGE OF MEDICINE A. Geno Andreatta, M.S., Assistant Professor; and Dean for Admissions and Student Affairs
	STATE UNIVERSITY OF NEW YORK AT BUFFALO SCHOOL OF MEDICINE Stuart L. Keill, M.D., Clinical Professor of Psychiatry
	ALBANY MEDICAL COLLEGE OF UNION UNIVERSITY Richard H. Edmonds, Ph.D., Professor of Anatomy; and Associate Dean for Academic and Administrative Affairs
	ALBERT EINSTEIN COLLEGE OF MEDICINE OF YESHIVA UNIVERSITY Albert S. Kuperman, Ph.D., Associate Dean for Educational Affairs
	MOUNT SINAI SCHOOL OF MEDICINE OF THE CITY UNIVERSITY OF NEW YORK Barry Stimmel, M.D., Associate Professor and Acting Chairman, Department of Medical Education; and Dean for Academic Affairs, Admissions, and Student Affairs
	NEW YORK UNIVERSITY SCHOOL OF MEDICINE Michael L. Shelanski, M.D., Ph.D., Professor and Chairman, Department of Pharmacology
10:30 a.m.	DIALOGUE: Mr. Andreatta; Drs. Keill, Edmonds, Kuperman, Stimmel, Shelanski; Panel; and Audience
10:55 a.m. - 11:20 a.m.	COFFEE BREAK
11:20 a.m.	UNIVERSITY OF CONNECTICUT John Tanaka, Ph.D., Professor of Chemistry; and Director of Honors Program
	FORDHAM UNIVERSITY (FORDHAM COLLEGE) Monica J. Kevin, Ph.D., Associate Professor of Biology; and Premedical Chairperson
	HAMILTON COLLEGE George E. Miller, M.D., Chairman, Health Professions Advisory Committee; and Director of the Health Center
	HAVERFORD COLLEGE Jenette H. Wheeler, M.D., Premedical Advisor
	HUNTER COLLEGE OF THE CITY UNIVERSITY OF NEW YORK Irwin Oreskes, Ph.D., Professor of Medical Laboratory Sciences; and former Dean, School of Health Sciences
	JOHNS HOPKINS UNIVERSITY SCHOOL OF ARTS AND SCIENCES John W. Gryder, Ph.D., Professor of Chemistry; and Associate Dean
	SMITH COLLEGE Margaret A. Olivo, Ph.D., Associate Professor of Biological Sciences
12:30 p.m. - 1:00 p.m.	DIALOGUE: Drs. Tanaka, Kevin, Miller, Wheeler, Oreskes, Gryder, Olivo; Panel; and Audience
1:00 p.m. - 2:00 p.m.	LUNCH BREAK
2:00 p.m.	JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE John H. Yardley, M.D., Professor of Pathology; and Associate Dean for Academic Affairs
	UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE Murray M. Kappelman, M.D., Professor of Pediatrics; and Associate Dean for Medical Education and Special Programs

* The AAMC Project on the General Professional Education of the Physician and College Preparation for Medicine is made possible by a generous grant from The Henry J. Kaiser Family Foundation

Thursday, May 5, 1983
(Continued)

TIME	PRESENTERS
	UNIVERSITY OF MEDICINE AND DENTISTRY OF NEW JERSEY/NEW JERSEY MEDICAL SCHOOL Elizabeth A. Alger, M.D., Associate Professor of Medicine and Anatomy; and Associate Dean for Education
	BROWN UNIVERSITY PROGRAM IN MEDICINE Louis Hochheiser, M.D., Associate Professor and Chairman, Section of Family Medicine
	CASE WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE Robert C. Griggs, M.D., Professor of Medicine; and Associate Dean for Student Affairs
	UNIVERSITY OF CONNECTICUT SCHOOL OF MEDICINE Carl F. Hinz, Jr., M.D., Professor of Medicine; and Associate Dean of Academic Affairs
3:00 p.m. - 3:30 p.m.	DIALOGUE: Drs. Yardley, Kappelman, Alger, Hochheiser, Griggs, Hinz; Panel; and Audience
3:30 p.m. - 4:00 p.m.	COFFEE BREAK
4:00 p.m.	PENNSYLVANIA STATE UNIVERSITY COLLEGE OF MEDICINE Eugene A. Davidson, Ph.D., Chairman, Department of Biological Chemistry; and Associate Dean for Education
	UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE George E. Ruff, M.D., Professor and Acting Chairman, Department of Psychiatry
	UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE Robert E. Olson, M.D., Ph.D., Professor of Biochemistry; and Associate Dean for Academic Affairs
	YALE UNIVERSITY SCHOOL OF MEDICINE Fred S. Wright, M.D., Professor of Medicine and Physiology; and Chairman, Curriculum Committee
	MCMASTER UNIVERSITY SCHOOL OF MEDICINE G.D. Sweeney, M.D., Professor of Internal Medicine; and Disciplines Coordinator
	GEORGE WASHINGTON UNIVERSITY SCHOOL OF MEDICINE AND HEALTH SCIENCES John Ott, M.D., Professor and Chairman, Department of Health Care Sciences
5:00 p.m. - 5:30 p.m.	DIALOGUE: Drs. Davidson, Ruff, Olson, Wright, Maudsley, Ott; Panel; and Audience
5:30 p.m.	RECESS

PROGRAM

NORTHEASTERN REGIONAL HEARINGS

Hosack Hall
New York Academy of Medicine
Two East 103rd Street
New York, New York

Friday, May 6, 1983

PRESIDING: Steven Muller, Ph.D., Chairman, AAMC Project Panel on the General Professional Education of the Physician*; and President, The Johns Hopkins University and The Johns Hopkins Hospital

TIME	PRESENTERS
9:00 a.m.	ASSOCIATION OF ANATOMY CHAIRMEN Gordon I. Kaye, Ph.D., Professor and Chairman, Department of Anatomy, The Albany Medical College of Union University
	ASSOCIATION FOR THE BEHAVIORAL SCIENCES AND MEDICAL EDUCATION Shirley N. Fahey, Ph.D., Director, Division of Social Perspectives in Medicine, University of Arizona College of Medicine
	ASSOCIATION OF DEPARTMENTS OF FAMILY MEDICINE William L. Stewart, M.D., Professor and Chairman, Department of Community Health and Family Medicine, University of Florida College of Medicine
	AMERICAN ASSOCIATION OF NEUROLOGICAL SURGEONS Martin H. Weiss, M.D., Professor and Chairman, Department of Neurological Surgery, University of Southern California School of Medicine
	ASSOCIATION OF UNIVERSITY PROFESSORS OF OPHTHALMOLOGY Guy H. Chan, M.D., Chairman, Department of Ophthalmology, Temple University School of Medicine
	ASSOCIATION OF MEDICAL SCHOOL PEDIATRIC DEPARTMENT CHAIRMEN Joseph W. St.Geme, Jr., M.D., Professor and Executive Chairman, Department of Pediatrics, University of California, Los Angeles, School of Medicine
	AMERICAN ASSOCIATION OF CHAIRMEN OF DEPARTMENTS OF PSYCHIATRY John E. Adams, M.D., Professor and Chairman, Department of Psychiatry, University of Florida College of Medicine
	SOCIETY OF CHAIRMEN OF ACADEMIC RADIOLOGY DEPARTMENTS Harry Z. Mellins, M.D., Professor of Radiology, Harvard Medical School
10:20 a.m. - 10:50 a.m.	DIALOGUE: Drs. Kaye, Fahey, Stewart, Weiss, Chan, St.Geme, Adams, Mellins; Panel; and Audience
10:50 a.m. - 11:20 a.m.	COFFEE BREAK
11:20 a.m.	DARTMOUTH MEDICAL SCHOOL Thomas Almy, M.D., Third Century Professor of Medicine, and Professor of Community and Family Medicine
	HOWARD UNIVERSITY COLLEGE OF MEDICINE Pauline Y. Titus-Dillon, M.D., Professor of Internal Medicine and Endocrinology; and Associate Dean for Academic Affairs
	NORTHEAST ASSOCIATION OF ADVISORS TO THE HEALTH PROFESSIONS William Hussey, Ph.D., President; and Adjunct Professor of Chemistry, Brooklyn College
	RURAL PRACTICE NETWORK John D. Matthew, M.D., Practicing Physician, Plainfield, Vermont
12:00 noon - 12:30 p.m.	DIALOGUE: Drs. Almy, Titus-Dillon, Hussey, Matthew; Panel; and Audience
12:30 p.m.	ADJOURN

---

* The AAMC Project on the General Professional Education of the Physician and College Preparation for Medicine is made possible by a generous grant from The Henry J. Kaiser Family Foundation